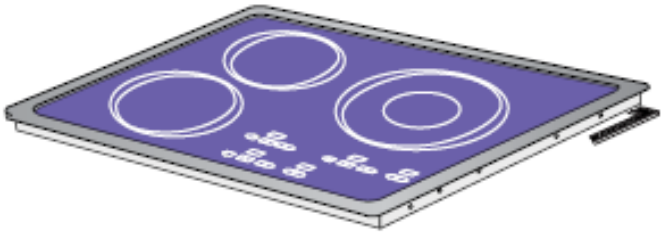

Induction hobs

Service Manual: H1-63-01

Type designation	Used in KAG model	Used in TEKA models	TEKA No.
Induction IX4000	CKA 850	GKST 58	077622
	EKI 60.0	GKST 60	077636
	PCKI 600	GKST 60	077623
	PCKI 750	GKST 60	077658
		GKST 60	077723
		GKST 80	077704
		GKST 58	077634
Induction IX6	EKI 957.0	GKST 80	077874
		GKST 80	077875
		GKST 90	077867
		GKST 90	077923
		GKST 90	077867
		GKST 90	077923
		GKST 80	077874
		GKST 80	077875
Induction IX7	EKI 957.1		
	EKI 6030.0		

Responsible: D. Rutz
Email: dieter.rutz@kueppersbusch.de
Phone: (0209) 401-733
Fax: (0209) 401-743
Date: 16.07.2009

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Kundendienst
Postfach 100 132
45801 Gelsenkirchen

Contents

1. Safety instructions

Danger!

Repairs may only be carried out by a qualified electrician!
Improper repairs can be extremely dangerous for the user.

It is essential that you observe the following instructions in order to prevent electric shocks:

- The casing and the frame may be live in the event of faults!
- Touching live components inside the appliance may cause dangerous currents to flow through your body!
- Disconnect the appliance from the mains prior to carrying out any repair work!
- When inspecting live parts, a residual current circuit breaker must always be used!
- Always ensure that an earthed conductor is properly connected! The earth wire resistance must not exceed that specified in the standard! It is of vital importance for ensuring the safety of people and the functioning of the appliance.
- On completion of repairs, an inspection must be carried out in accordance with VDE 0701 [Association of German Electrical Engineers] or the corresponding regulations for your country!
- Do not touch any of the components in the appliance. The modules are also live!
- Observe instructions on electrostatic hazards!

Attention!

Make sure you observe the following instructions:

- The appliances must be disconnected from the mains prior to all repairs. If inspections must be carried out on live appliances, make sure you use a residual current operated device.

Sharp edges!
Use protective gloves!

Components may be electrostatic!
Observe handling precautions!

2. Repair instructions

- Never attempt to carry out repairs by “randomly replacing” components!
- Always proceed systematically and observe the technical documentation that goes with the appliance!
- Electronic circuit boards are generally not repaired; instead they are completely replaced with original spare parts. Exceptions are documented separately.

3. General information on induction

The inductive component is a choking coil which directly converts magnetic energy into heat.

Induction is based on the principle of the electromagnetic field.

The principle of heating by induction is a natural phenomenon discovered in the 19th century by several physicists, among whom Léon Foucault. He highlighted the development of currents facing the magnetic field in a moving metallic mass or a fixed metallic mass run through by a variable magnetic flux. These eddy currents in comparison to short-circuits cause a heating effect (Joule effect) in the mass.

Only since the middle of the 20th century induction started being used as a heating means, mainly in industries like the steel (induction furnaces). Induction only found its place in kitchens in the 80s, or even 90s for domestic electrical appliances.

The operating principle is innovating. Contrary to other cooking modes, it is the container itself, which heats and not the hob.

You put a saucepan down and this is sufficient to initiate the heat while the hob remains cold. The heating element is nothing but the container metal, which transforms the magnetic energy into thermal energy.

Induction qualities are flexibility, low inertia, easy cleaning, good efficiency and thermal safety.

Induction enables a litre of water to boil in two minutes, milk to heat without overflowing and chocolate to melt just as desired. Induction efficiency may reach up to 90% according to the types of cooking.

With such a technique, only the container heats. Inertia is therefore low and, above all, the plate temperature never exceeds the saucepan temperature.

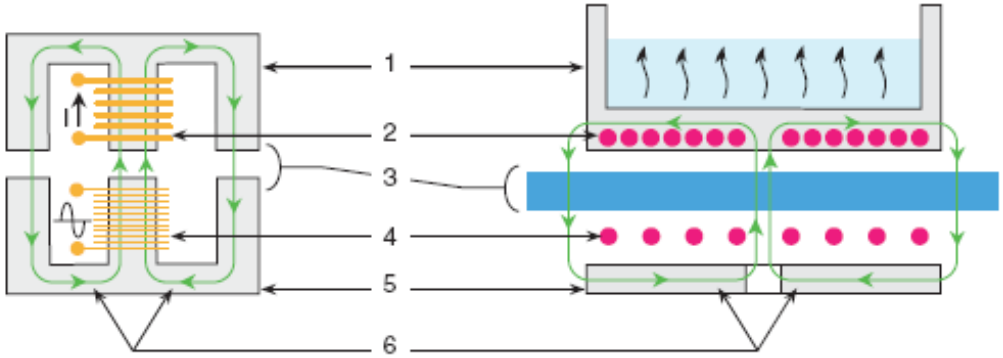
Stepping from the mildest temperature to the strongest power, in an instant and while diffusing heat in a homogeneous way, attracts more and more consumers.

4. The operating principle

4.1 Analogy with the transformer

An induction hob operates due to the electromagnetic properties of most containers used on traditional hobs.

One can compare this hob with a transformer of which the secondary winding would have been shorted. A significant internal current arises therein and causes quick heating.



TRANSFORMER		INDUCTION HOB
Magnetic conductor	1	Saucepan
Secondary winding shorted	2	Saucepan
Gap	3	Glass-ceramic plate
Primary winding	4	Inductor
Magnetic conductor	5	Ferrite
Magnetic field	6	Magnetic field

The saucepan can be compared with a shorted set of concentric whose internal resistance is not zero.

From the function keys, you control the electrical power supply to the transformer primary winding which generates a magnetic field. This field induces currents at the bottom of the container placed on the hob. These induced currents heat the container immediately, which transmits the produced heat to the food inside. Cooking is performed efficiently with almost no loss of energy. The appliance heating power is pushed to its maximum.

4.2 Skin effect

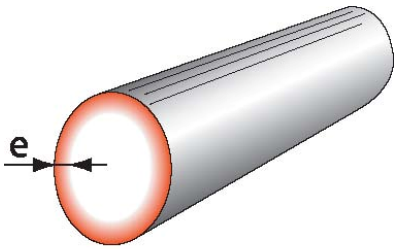
An induced current in a metallic mass will only cause significant heating if it flows through a significant resistor ($P=RI^2$). A ferrite saucepan has only low resistivity. This is where a second natural phenomenon occurs, which is called “Skin effect”.

4.2.1 Definition

The propagation of the high-frequency current is not performed in the same way as a direct current. Contrary to direct current, where current flows with consistency in a conductor, in HF its density varies and decreases exponentially as you move away from the conductor surface.

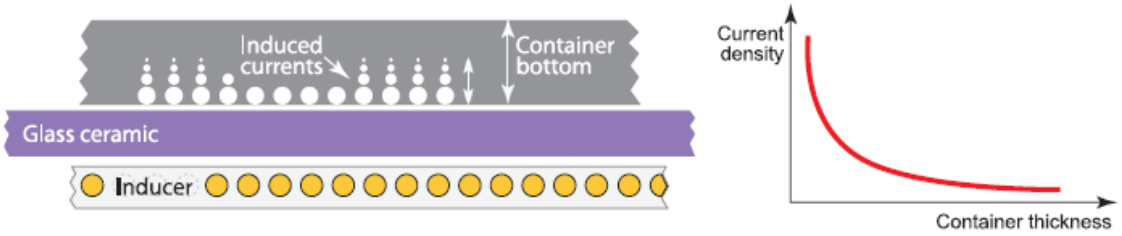
Example on copper wire supplied with high frequency

The current flows predominantly in wire periphery “e”. The decrease in the effective cross-sectional area of the conductor causes an increase in its resistance.



4.2.2 Application

At a 20 kHz frequency, and for a steel saucepan (magnetic ferritic material), the thickness of the saucepan in which the induced currents flow is approximately 35 µm. This allows generating a current in only a part of the saucepan bottom. The resistance becomes significant and the heating consequent therein.



For a non-ferritic material, such as aluminium, the thickness is approximately 590 µm, the saucepan behaves then as a quasi-zero resistor (short-circuit), which is prejudicial to electronics. The board will take this discrepancy into account and will display the phenomenon by making the control panel flash.

Therefore, this type of material is not adapted.

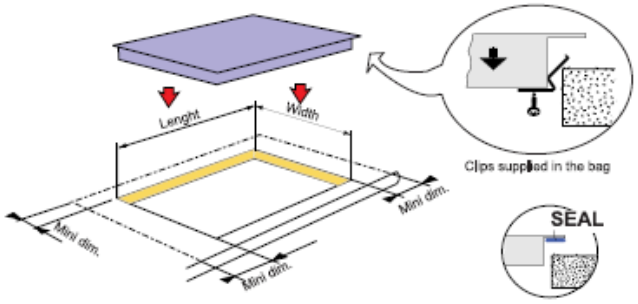
5. Installation

Attention!
It is essential that information contained in the installation instructions for the individual models be observed!

5.1 Installation above kitchen units

If the hob is positioned above kitchen units (side walls, drawers, etc.) it is recommended that a shelf be installed at a clearance of at least 20 mm to the bottom of the hob.

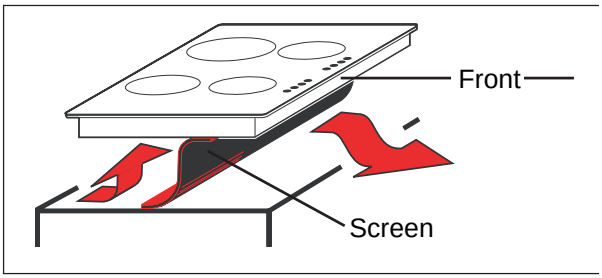
Due to a risk of fire, it must be ensured that no combustible, inflammable or heat deformable objects are positioned or placed right next to the hob or under it.



When installing the hob above a drawer, care must be taken that no sharp items are stored in the drawer, since these could become bent on the underside of the hob and prevent the drawer from being opened and closed.

5.2 Ventilation

Many after-sales department problems are related to bad ventilation. The induction hob is fitted with a cooling fan that sucks the air through the rear and discharges it to the front. It is necessary, during the installation, to scrupulously observe the recommendations provided by the user manual. Depending on the kitchen layout, the hob will be installed:



- over a furniture with door or with drawer
- over an oven of same brand

Clearance between the induction hob and kitchen furniture or built-in units must provide for sufficient ventilation of the induction hob.

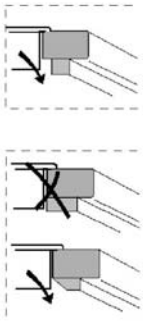
It is recommended that ventilation openings are thermally separated with the shield provided. This prevents air that has been heated up from flowing back to the cool air intake device.

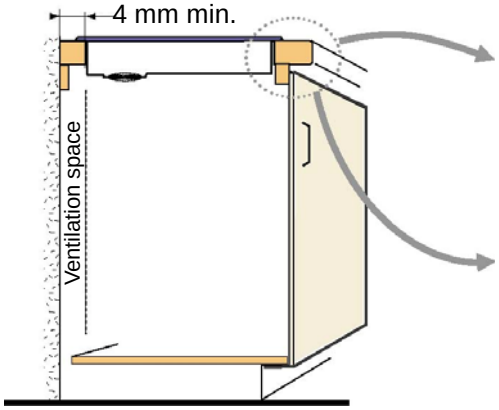
Attention!
The shield may not cover the ventilation holes; it may need to be shortened to fit the built-in appliance support.

5.2.1 Installation above a kitchen unit

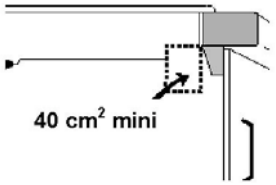
Attention!
The hob should not be fitted over a washing machine, refrigerator or a freezer.

1. In the case of a small cross-piece, no special contraints.
2. In the case of a rectangular cross-piece or closed top, perform bevelled cutting to clear the air outlet.



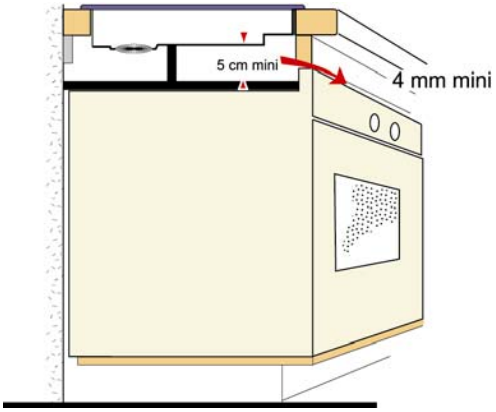


3. In the case of a prolonged use of several sources simultaneously or of use in warm period, it is recommended you to drill lateral orifices in the sides of the furniture, at the front, to provide better evacuation of the hot air (40 cm² minimum).



5.2.2 Over an oven of the same brand

The installation must guarantee fresh-air inlet at the rear. The front outlet must 7 mm minimum and the oven must have a housing cooling.



5.3 Electrical connection

(see instructions for installation and operation)

Attention!
The manufacturer will not accept ANY guarantee for resulting losses if the appliance is operated without any earthing or with insufficient earthing!

6. Use

See instructions for use for the individual models.

6.1 Available power levels (differs for the different models)

Induction hobs propose 9, 12 or 15 power levels on each cooking zone, usually comprised between 50 and 2800 W. Certain cooking zones (triple crown or Krône) integrate a booster function that provides a power of 3200 or 3600 W

1	2	3	4	5	6	7	8	9	10	11	12
50W	100W	200W	300W	400W	500W	750W	1000W	1250W	1500W	2000W	2800W
Clipping 500W power supply						Power supply with variable frequency					

Example of IX6 control with 13 power levels and with a 160 mm or 180 mm diameter

1	2	3	4	5	6	7	8	9	10	11	12	13 or P
50W	100W	150W	250W	350W	500W	650W	800W	950W	1150W	1400W	1800W	2200W
Clipping 500W power supply						Power supply with variable frequency						

Example of IX6 control with 13 power levels and with a 210 mm diameter

1	2	3	4	5	6	7	8	9	10	11	12	13 or P
50W	100W	150W	250W	350W	500W	650W	800W	950W	1150W	1400W	2000W	3100W
Clipping 500W power supply						Power supply with variable frequency						

Example IX6 control with 13 power levels and with a 280 mm diameter

1	2	3	4	5	6	7	8	9	10	11	12	13 or P
100W	200W	300W	400W	500W	600W	800W	1000W	1200W	1400W	1800W	2800W	3600W
Clipping 500W power supply						SPower supply with variable frequency						

The returned power is variable according to the saucepan dimensions and nature. The above values have been obtained with an enamelled sheet metal saucepan of 210 mm diameter.

- For a power lower than 500W (1 to 5), the power varies by clipping the 500 W.
- From 500W to 2800W (6 to 12), the power varies by frequency variation (50 kHz for 500 W and 25 kHz for 2800 W).

Attention!
A generator can feed two sources. If these two sources are operating simultaneously, the maximum power will be limited due to the power distribution between front and rear. The distribution is performed either by relays, or by transistors.

7. Functions in general (differs for the different models)

7.1 Booster function

This function concentrates the maximum power on only one inductor.

The “Boost”, “MAX” or “Express” function are not made to cook during a long time but for a speed increase of the temperature in order to boil water for example.

Boost function atomically limits the power of the other inductor.

7.2 Start control

This function allows programming of the end-of-cooking time.

It’s necessary to set:

- End of cooking time (24h possible)
- A duration (99 min. max.)
- A cooking power (limited at 6 in order to cook lovingly or keep warm)

Display lights up automatically when the start time has been reached and without “d”. Press the ON/OFF key to cancel the program.

7.3 Safety devices

7.3.1 Residual heat

The latest models propose a “top hot” display. After intensive use, the cooking zone can remain hot for a few minutes. An “H” (indicator of residual heat) is displayed during this period.

7.3.2 Automatic stop

The induction hob has an automatic time limit function, i.e. as soon as a pot is removed from a cooking zone, the zone is switched off. The automatic time limit function will be activated if a pot is accidentally left on a cooking zone.

The duration of continuous use of each cooking zone depends on the power level selected (see chart).

This requires that the cooking zone setting is not changed when the zone is in use.

When the operation time limit function is activated the cooking zone will switch off, a time-limited buzzer will sound and "A" or "AS" (automatic stop) will appear in the display.

9 power levels	12 power levels	15 power levels	Operation time limit
1 - 4	1 - 7	1 - 9	8 hours
5 - 7	8 - 11	10 - 14	2 hours
8 - 9	12 and boost	15 and boost	1 hour

7.3.3 Information keeping

Power cut:	Information lost after four minutes.
Absence of non-compatible saucepan or container:	Source cut after one minute.
On/Off:	If there is no other information, source cut after 30 seconds.

7.3.4 Child proof lock

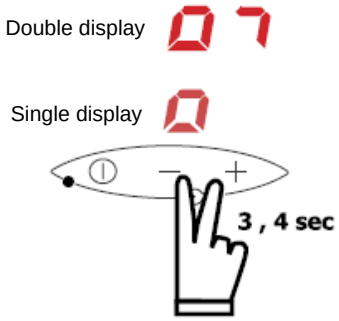
On certain models, the controls can be locked:

- either when off

  or

- during use (the current operations subsist and displayed settings remain active).

However in locked position, for safety reasons, the “off” key has priority and cuts the source supply. The small illuminated “0” goes off after a few seconds.



7.3.5 Safety in case of overflow

In case of overflow, induction ho bis equipped with a safety feature. This function allows an automatic switch off of the hob with signal “-” and an audible alert, in case of:

- overflow covering the control keys;
- wet towel covering the control keys;
- metallic object put on the control keys.

Moving dashes = overheating of the transistors and the electronic unit

7.3.6 Small objects

A small pan, a fork, a spoon or each other small objects are not detected as a container. The display flashes, no power is delivered.

7.3.7 Pacemakers and active implants

The hob operation is in accordance with the standards on electromagnetic interference in force. The induction hob meets thus perfectly the legal requirements (directives 89/336/CEE). The hob is designed not to hinder the operation of other electrical appliances to the extent where they comply with the same regulations. An induction hob generates magnetic fields in its very close environment.

To prevent interference with a pacemaker, the pacemaker must be designed in accordance with the regulation concerning it. For any information regarding the conformance or no of a pacemaker, the consumer must get information from the manufacturer or his/her attending physician.

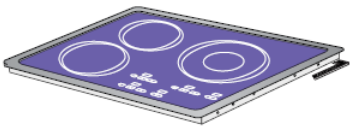
7.3.8 Temperature limiter

Each inductor uses a NTC sensor measuring the container temperature through the glass. This system help protecting the hob and the containers against over heating (pan without food for example).

In case of overheating, the temperature of the pan is regulated around 300 °C. This temperature does not allows the deterioration of the PFTE (anti sticking material used in the pans). Damages start above 340/350 °C.

8. General Instructions for Cleaning and Care

Glass ceramic is a silicium-based material that does not expand like glass. Its dimensions do not practically vary up to 750 °C, as a part of the molecules composing it expands under heat, while an equal number retracts. A feature of this material is that it is a poor heat conductor and therefore limits heat loss.



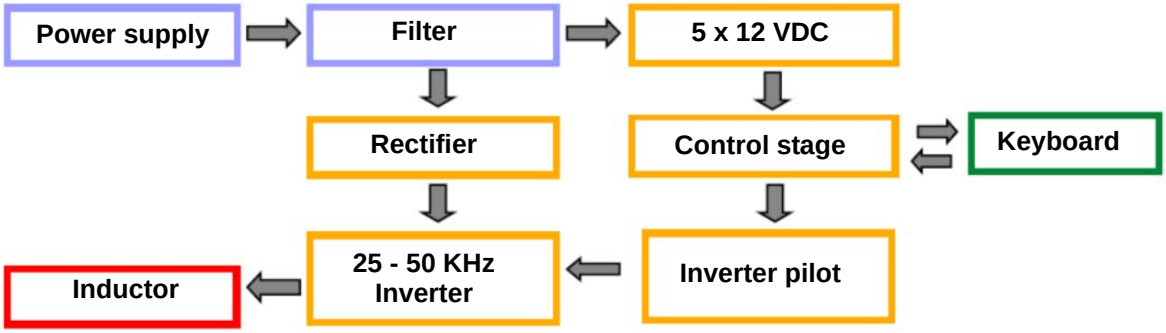
The plane surface of the glass ceramic and the sensitive controls make cleaning easy. The own cleaning difficulties of radiant and halogen sources are usually groundless on induction hob, owing to the low temperatures attained by the table.

However, a saucepan with humid bottom put on the source leaves limestone traces. Sugar discharges should be cleaned immediately, as in contact with hot glass ceramic the sugar caramelizes. When cooling down, it retracts and attacks the coating. Lastly, the glass-ceramic hob is not a working plane and thus is easily scratched.

See also Technical Information T1-00-01 “Breakage Analysis for CERAN® Cooking Surfaces”.

9. Operating steps

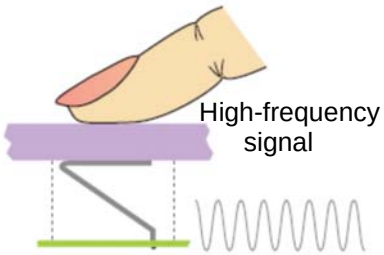
9.1 Block diagram



9.2 Keyboard with sensor keys (capacitive keys)

These keyboards provide a working plane without air inlet (and thus grease inlet).

The key activation is validated when the user's finger disturbs the high-frequency signal applied to a blade. For a good operation, each blade should be perfectly in contact under the glass ceramic.



9.3 Controls

The entire process is controlled by a microprocessor.

The circuit boards are integrated: 5 A and 12 VDC limited power consumption (for the power supply for the keys); the controls (together with the controls for the keys), the rectifier, converter and the filters.

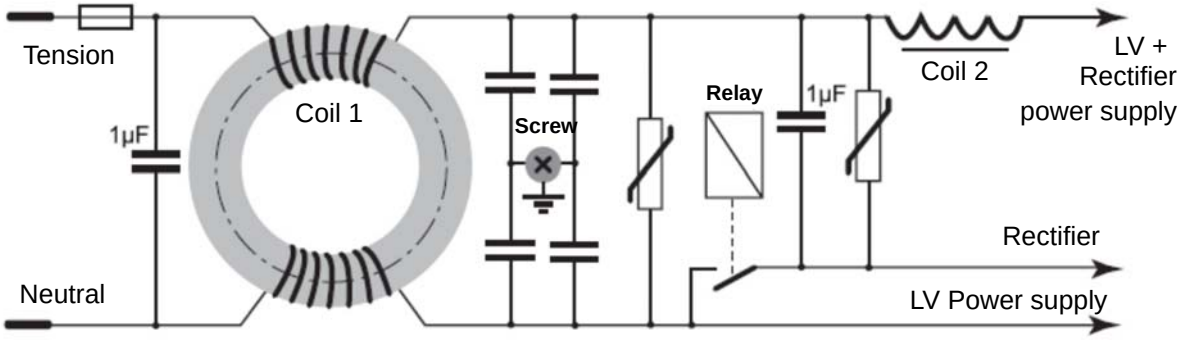
9.4 Filtering

By design, the appliance can generate significant high-frequency interference. In order to guarantee a minimum interference level, an important filtering device is used. It enables induction hobs to be environment-friendly appliances, whose interference level is smaller than that of a television set.

The “filtering” stage fulfils several missions:

- It protects from operating overcurrents
- It eliminates incoming and outgoing interference
- It eliminates overvoltages (voltage peaks)

For this purpose, the same components are almost always used: filtering capacitors, fuse(s), VDRs, high-inductance choke coils and an indispensable earthing.

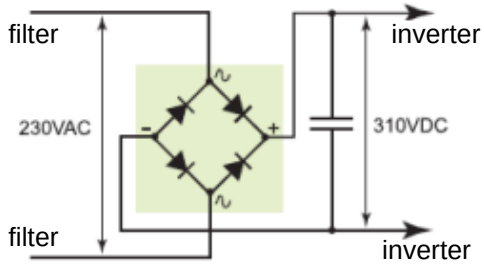


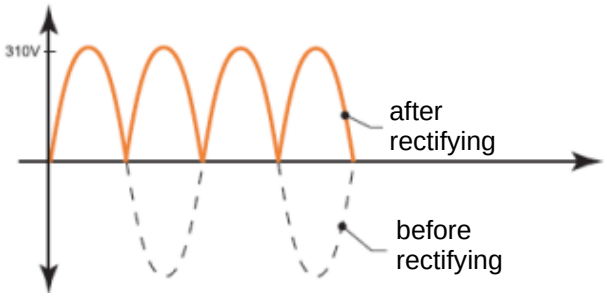
- VDR (Voltage Dependent Resistor) begins conducting at 275 or 420 V (according to the model) and eliminates voltage peaks.
- The fuse preventing overcurrents is done so using a restriction on the board pad (fuse pad). Actually, there are two series-mounted fuses. Only the IX1 generation is protected by a cartridge fuse, it is a so-called “very rapid” fuse.
- Choke coils have a “damping” role that only allows low frequencies. Their action is complemented by 1 µF capacitors.
- The earthing is used to evacuate high-frequency interference “residues”.

Attention!
The screw attaching the filter has thus an essential role and shall be imperatively reinstalled after any action

9.5 Rectifier

To supply the inductors, it is necessary to apply a high frequency. To change over from 50 Hz to 50 kHz it is first necessary to rectify the main voltage through a diode bridge. A filtering capacitor (of 5 µF generally) is associated in order to attenuate the high-frequency signals. As shown by the illustration, the rectifier output voltage is approximately the main peak voltage (i.e. 310 VDC approx.) when no inductors are supplied. This voltage drops during the operation.



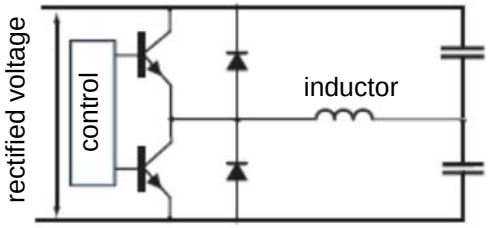


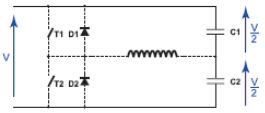
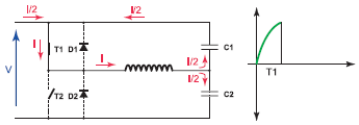
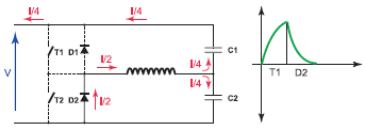
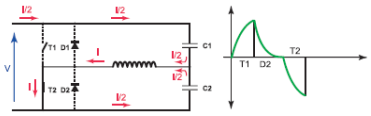
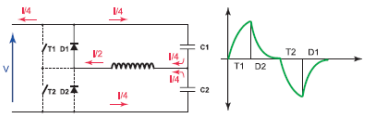
9.6 Inverter

The inverter is used to transform a DC signal into an AC signal with adjustable frequency. The inverter consists of two transistors (whose technology can vary according to the hob generation), two capacitors and two recovery diodes (indispensable on any inductive circuit).

Transistors are frequency controlled by a generator. This frequency varies between 25 kHz (for 2800 W) and (50 kHz for 500 W).

After establishment of a voltage on both capacitors, the operation can be broken down into four phases, as follows:

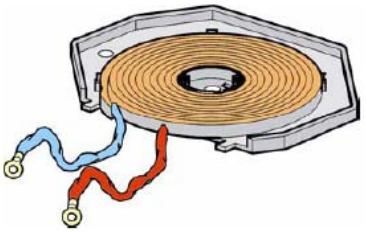


Phase 0	At rest	Transistors T1 and T2 act as two open switches. Capacitors C1 and C2 are supplied and charged to a voltage V/2, the bridge is balanced, there is no current in the inductor.	
Phase 1	Positive alternation	Transistor T1 is controlled and acts as a closed switch. A current flows through the inductor while C2 is charged to +V and C1 is discharged.	
Phase 2		Both transistors are blocked but the inductor forces a current flow. C1 is charged again to V/2 and C2 is discharged down to V/2. The bridge is balanced again => the current goes through 0 again.	
Phase 3	Negative alternation	Transistor T2 is controlled and acts as a closed switch. A current flows in reverse direction in the inductor while C1 is charged to +V, and C2 is discharged.	
Phase 4		Both transistors are blocked but the inductor forces a current flow. This is the recovery phase, where C2 is charged again to V/2, and C1 is discharged down to V/2, the bridge is balanced again => the current goes through 0 again. Return to step 1.	

10. Main components

10.1 Single inductor

Features



Simple coils can have various diameters:

- 16-cm diameter for small containers, 2000 or 2200 W.
  The container must have 10 cm minimum diameter.
- 18-cm diameter, which is the most current dimension, 2000 or 2800 W. 12 cm minimum diameter of the container.
- 21-cm diameter for larger-size containers, 2800 W.
  12 cm minimum diameter of the container.

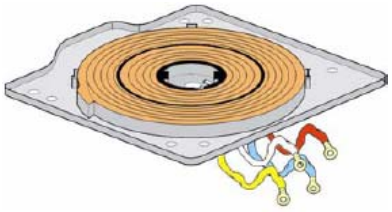
Function

This is a coil located under the glass ceramic, responsible for subjecting the magnetic field to the saucepan. It can have various sizes.

An earthed screen limits the action of the magnetic field on the electronics. This screen integrates, in its lower section, magnetic ferrites whose role is to direct the field to the saucepan.

10.2 “Krone” inductor

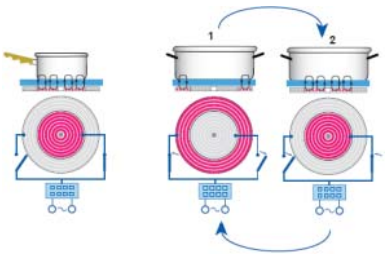
Features



The Krône source operates as two independent sources under the same generator. The diameters are 18 and 28 cm, respectively.

- P_{max}: 2800 W
- Booster: 3600 W

The power distribution



For saucepans with diameters comprised between 12 and 22 cm, the central source operates alone.
For saucepans with diameters greater than 24 cm, a power distribution is performed between the central source and outer source.

Saucepan Ø	Centre	Outside
24 - 26 cm	70%	30%
26 - 28 cm	50%	50%
28- 32 cm	30%	70%

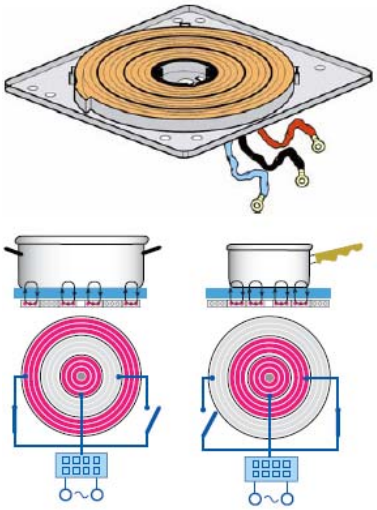
Function

The cooking zone recognizes and fits automatically the container diameter (12 to 32 cm) so as to deliver the optimum power, ensure excellent heat distribution in the container (making of large-diameter pancakes, large-size fish such as sole or of large fricassees such as paella).

A ‘Booster’ function is used to rise the maximum power (2800 W) up to 3600 W in order to bring rapidly to a boil a large quantity of liquid or of fat. (In this case, it is recommended not to exceed 5 to 6.5 min.)

10.3 Triple-crown inductor

Features



inductor composed of 3 windings

- Diameter 1: 6 cm
- Diameter 2: 10 cm
- Diameter 3: 22 cm
- P_{max}: 2800 W
- Booster: 3200 W

This source implies the use of a specific relay installed on the IX3WR power board. The generator always supplies two coils at a time but unlike the Krône source, there is no sequenced distribution between inside and outside: the board detects the presence or absence of a large-diameter source and defines its operating mode.

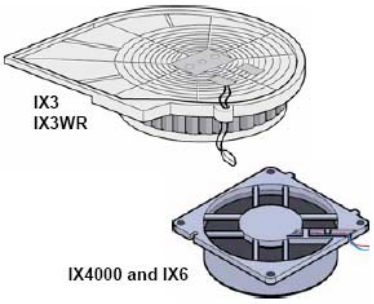
Function

The cooking zone recognises and fits automatically the diameter of the container, 12 to 26 cm diameter, so as to:

- deliver the optimum power corresponding to the container;
- give excellent heat distribution;
- provide a consistent cooking temperature.

10.4 Fan

Features



Each generation of hobs is characterized by a different fan:

- IX1: Tangential to 12 VDC
- IX2: 12 VDC
- IX3, IX3WR: 230 VAC, 23 W, 270 Ω
- IX4000, IX6: 12 VDC (PC type)

Function

Ensure cooling of electronic components located in the hob.

Please note: The fan voltage changes according to the temperature of the power board (measured by NTC probe): 8 V for 60 °C, 10 V for 70 °C, 12 V for 80 °C.

The temperature read by the NTC is not the temperature inside the cabinet but the copper temperature.

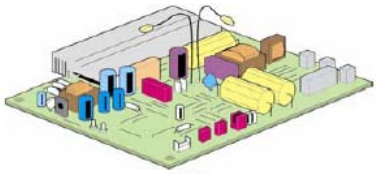
10.5 Power board

Features

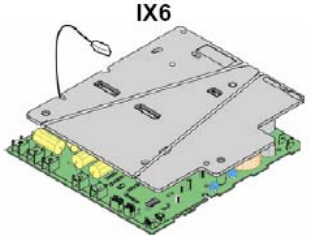
The circuit board controls the power (W) and the frequency (kHz).

For this purpose, two features exist:

- one uses a single inverter with front/rear distribution relay;
- the other uses one inverter per source.



IX6



Function

The power board is used to manage the majority of the functions:

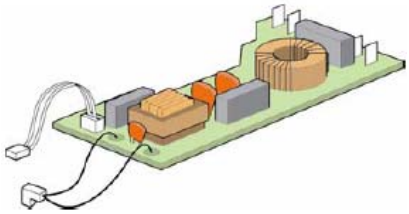
- rectification
- low-voltage power supply
- power supply to high-frequency inductors
- checks, using a microprocessor

10.6 Filter board

Features

The filter board is composed of:

- Several VDR
- High-value choke coils
- A power supply relay
- A fuse (fuse pad)



On IX2, IX4000 and IX6, the filter board is integrated in the power board.

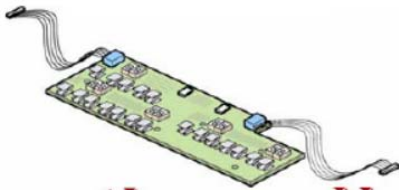
Function

The filter board is used to eliminate the voltage peaks originating from the mains (hob protection) and to protect the mains from interference generated by inductors.

10.7 Keyboard board

Features

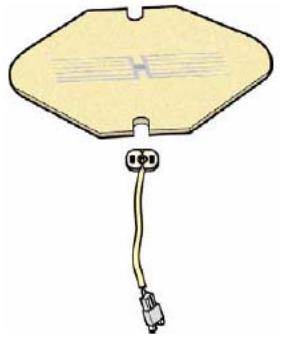
Each generation of hobs uses different keyboards. The communication with the power board is multiplexed.



Function

The keyboard board is used to control each of the sources. It is capable of integrating a timer for the rear source.

10.8 Temperature sensor



Features

The NTC is housed in a heat collector.

- IX1, IX2, IX6: 100 kΩ at 25 °C
- IX3, IX3WR and IX4000: 33 kΩ at 20 °C

Function

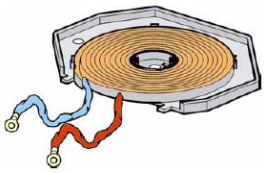
The temperature sensor is an NTC resistor. Its function is to determine a possible saucepan overheating, particularly in event of heating when empty (no heat dissipation).

In event of overheating, a power cut-off is performed by the power board until reaching the moderate temperature of the source.

The temperature sensor is not used to detect the presence of a container.

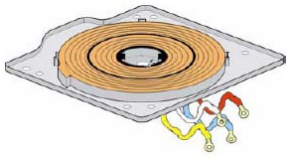
10.9 IX7 main components

10.9.1 Single inductor



Ø	Varistor	Board 3600W - 4600W				Board 3600W - 4600W		
		1	2	3	4	1	2	3
		front		rear		COM	front	rear
16 cm	2 point					X		X
	3 point	X	X			X	X	
18 cm	2 point			X	X	X		X
	3 point	X	X			X	X	
21 cm	2 point			X	X	X		X
	3 point					X	X	
21 cm alone	2 point					X		X
	3 point inserted					inserted	inserted	

10.9.2 Krône inductor



Ø	Varistor	Board 3600W - 4600W				Board 3600W - 4600W		
		Krone		Central 18 cm		Krone Central 18 cm		
28 cm	2 point + 3 point inserted	red	blue	white	yellow	yellow red	blue	white

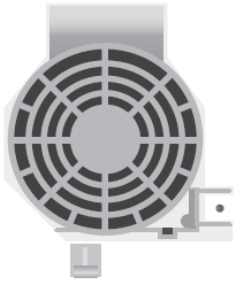
10.9.3 Merlin inductor

Ø	Varistor	Board 3600W - 4600W				Board 3600W - 4600W		
		Krone		Central 18 cm		Krone Central 18 cm		
MERLIN 2 x 3 inductors every 10 cm	A 2-point cooking zone at the back and a 3-point cooking zone at the front	red	red	white	white			

11. The IX4000 hobs

11.1 Description

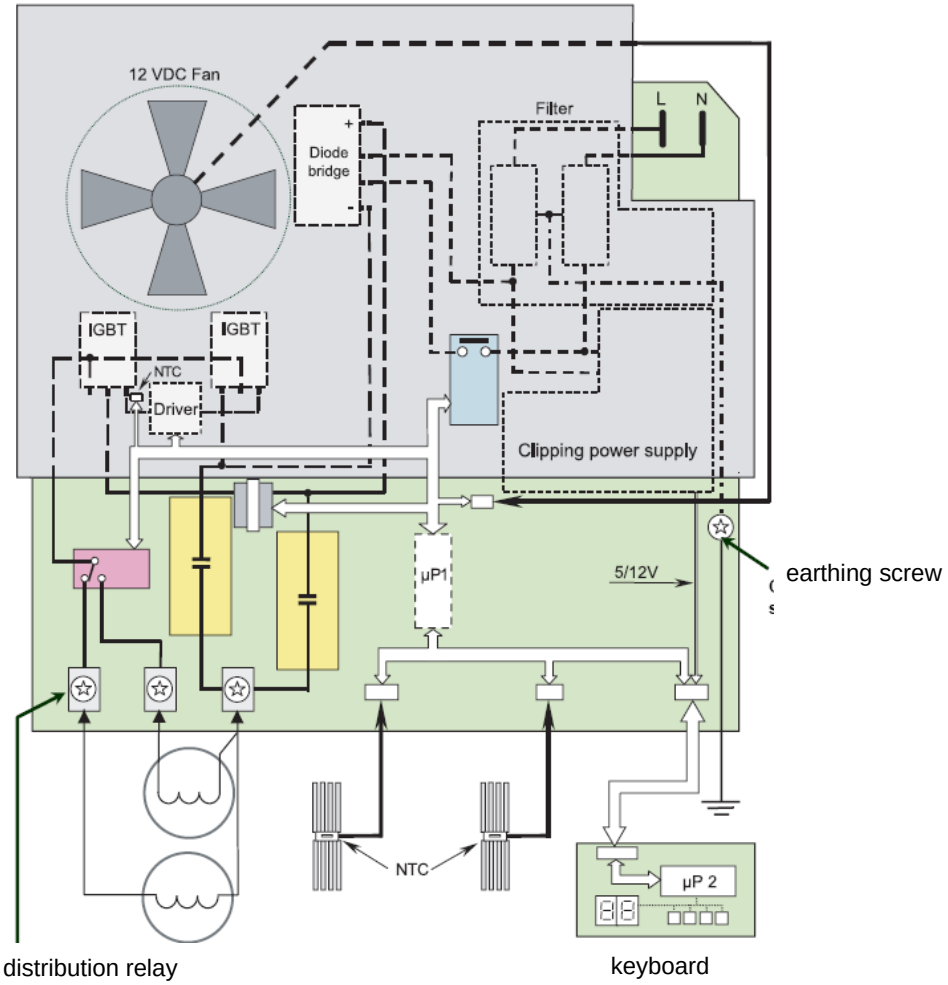
IX4000 is designed to meet the needs of bottom range inductions. It replaces version IX3, and complements the IX3WR offer.



It is easily identified thanks to its characteristic lower air inlet and controls the standard and Krône sources.

Production start: October 2002.

11.2 Internal organization



The filter board is integrated into power board.

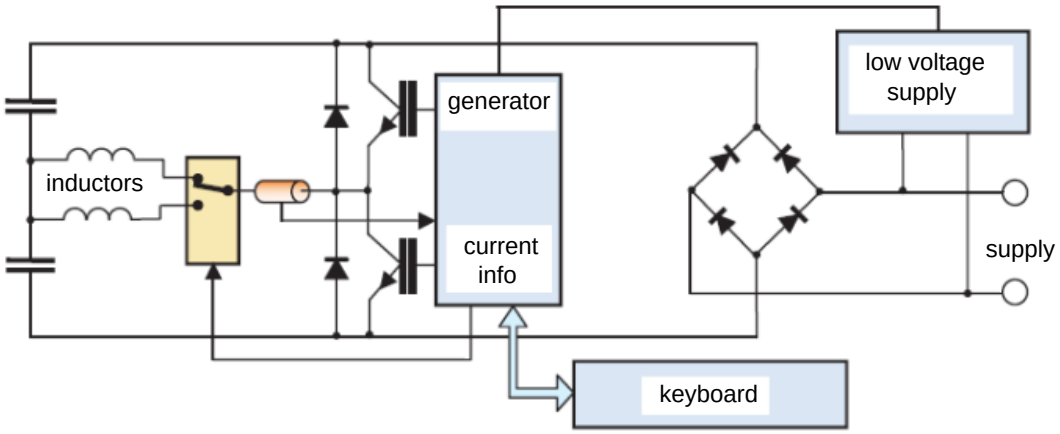
A unique relay is used for the power distribution between front source and rear source.

The fan used is supplied with 12 VDC and is comparable to what is used for computer power supplies.

Consumption in standby smaller than 1 W.

11.3 Details of the power circuit

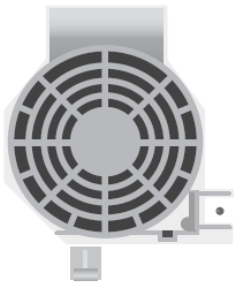
The power circuit is inspired from both the IX3 hob (for the principle) and the IX3WR hob (for components).



- Integrated rectifier bridge (located under dissipation sheet metal).
- Front / rear distribution ensured by a single relay.
- A current transformer ensures the saucepan detection.
- Use of IGBT transistors (**I**nsulated **G**ate **B**ipolar **T**ransistor) for the inverter.

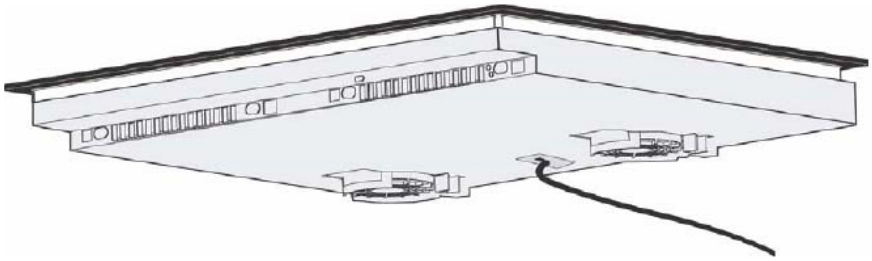
12. The IX6 hobs

12.1 Description



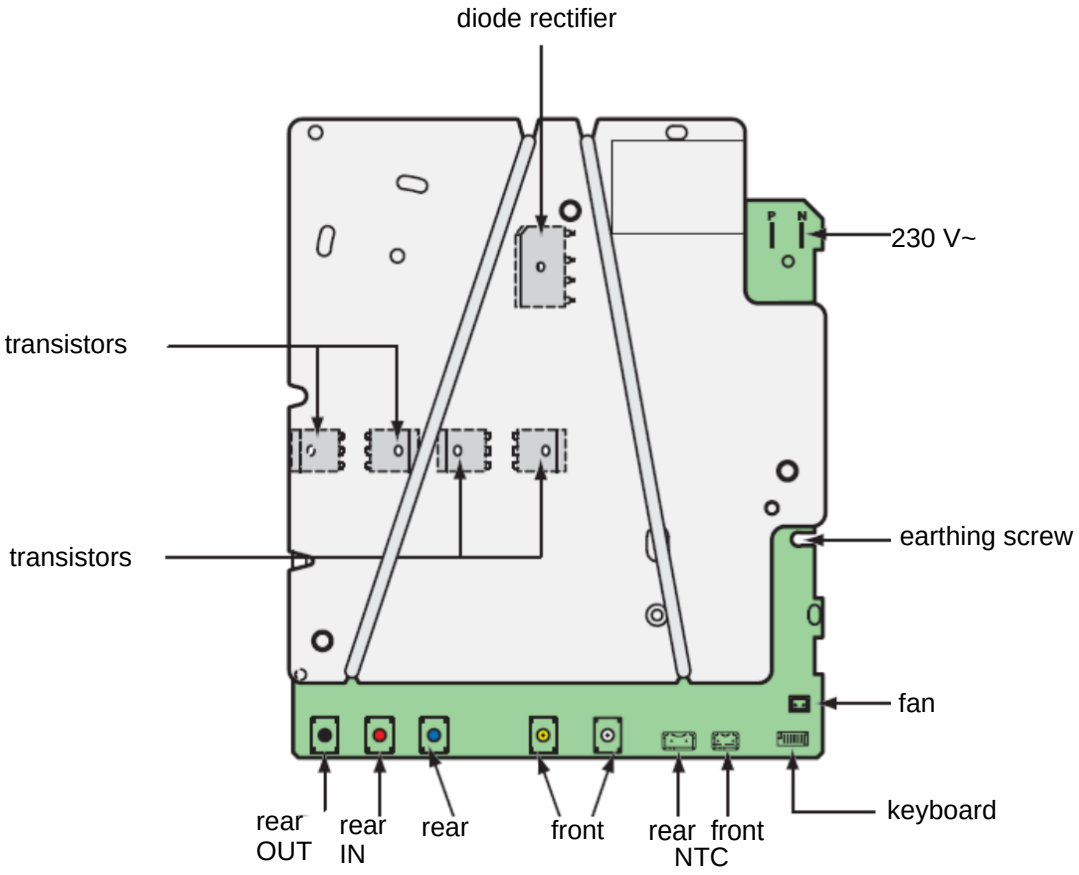
IX6 replaces the IX3WR electronic control. The air inlets are the same as for IX4000.

The cabinet has been modified to improve the air vacuum at the front and simplify the fitting.



The IX6 hobs can be recognized by its only one board including a large radiator over the electronic. The keyboard can be different according to the brand and the model.

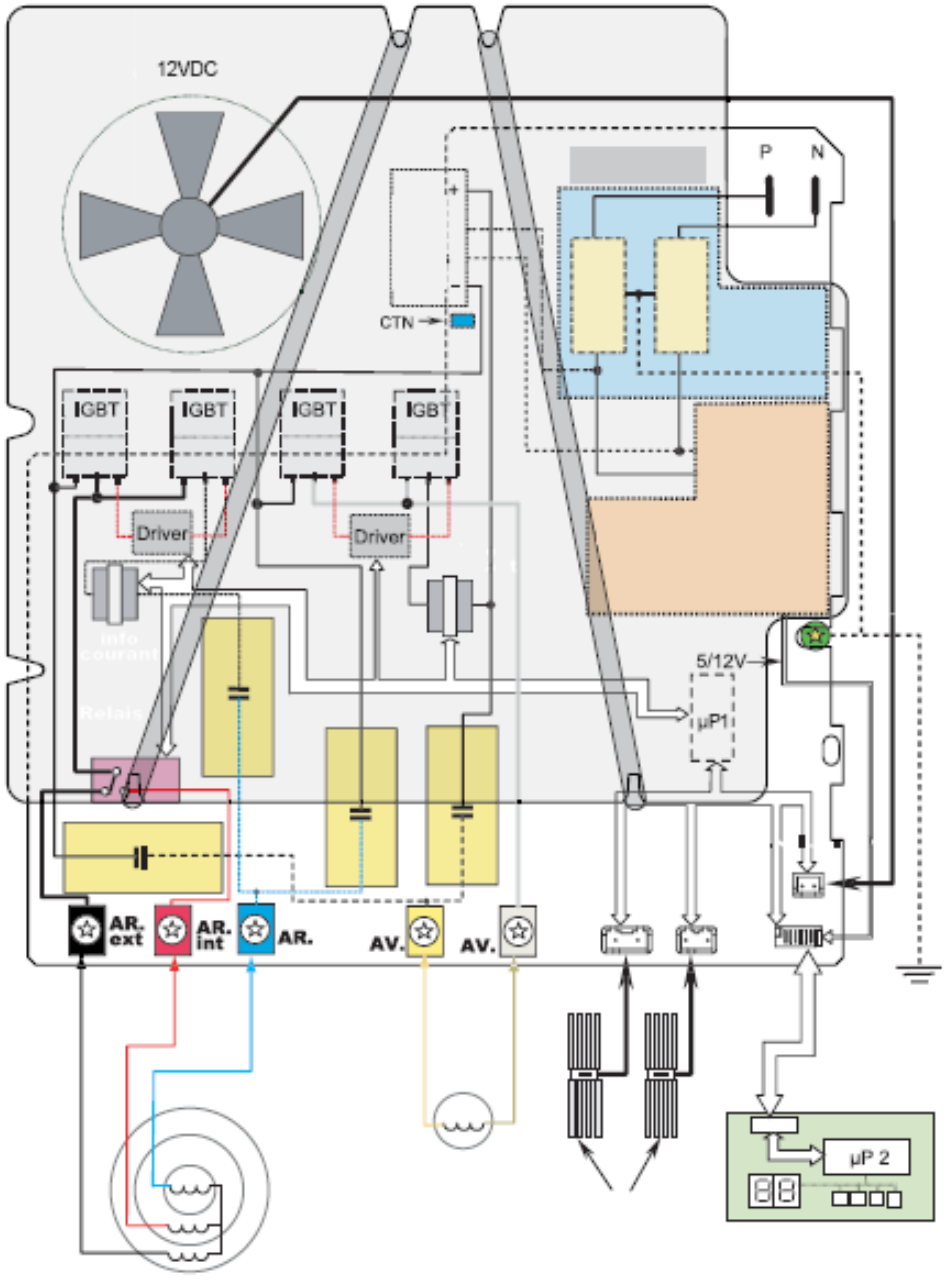
IX6 allows supplying all kinds of inductors. As IX3WR, IX6 includes a relay especially to manage triplecrown inductors. This relay doesn't manage the power distribution between 2 different inductors.



12.2 Internal organization

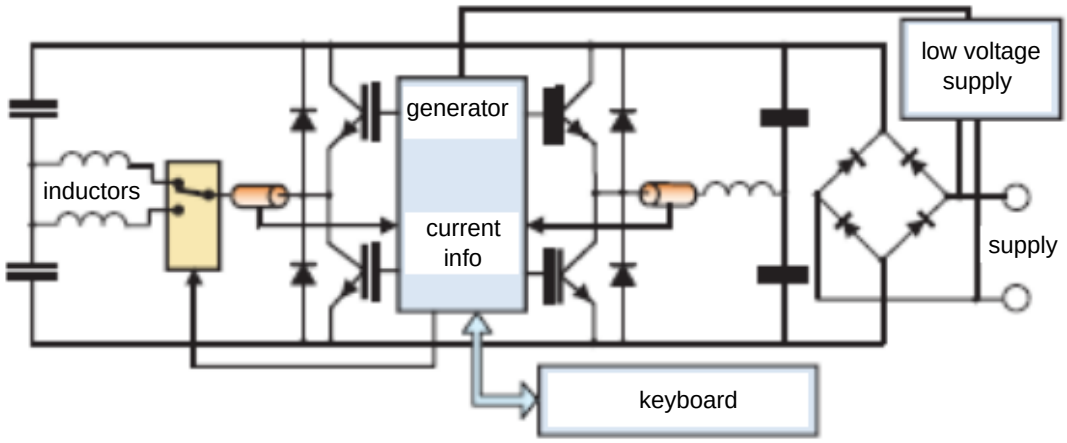
As for IX4000, the filter board has been included in the power board.

The fan is supplied under 12 VDC but this voltage can be under this value according to the measured temperature on the board.



12.3 Power circuit description

The power circuit uses the same principle as IX3WR (for the main components).



- 4 diode rectifiers
- The front / rear power distribution by relay is replaced by the inverter stage doubling. The result is: 2 x 2 recovery diodes, 2 x 2 capacitors, 2 x 2 transistors.
- A current transformer by inverter to ensure container detection.
- Use of IGBT transistors. The IGBT (Insulated Gate Bipolar Transistor) is a bipolar transistor that is voltage controlled. It associates the advantages of bipolar transistors (high voltages and currents) and those of MOSFET transistors (high-speed switching, low control energy).
- A relay provides control of a “triple crown” source.

13. The IX7 hobs

13.1 Description

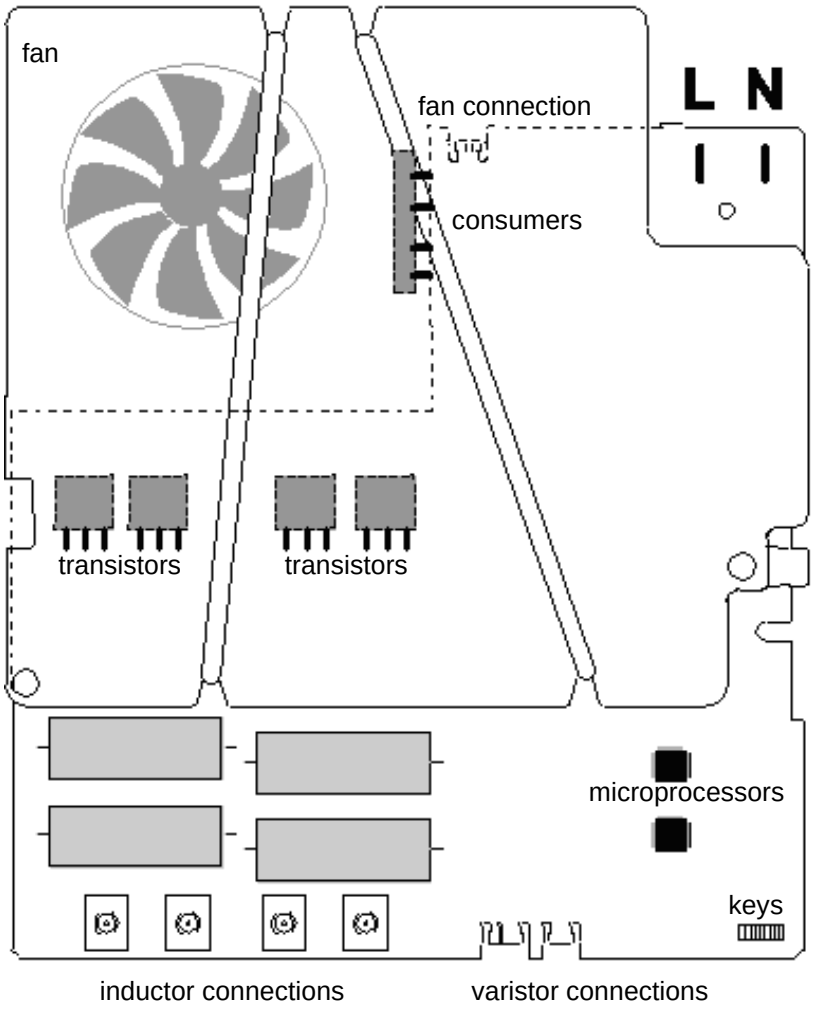
A new generation of the IX7 circuit was launched in 2007; it has more power (4600 W) and a new rectangular cooking zone - "Continuum" - onto which one large oval or round pan or several small pans (up to 3) can be placed.

The IX7 generation comes with different power levels:

- IX7 3100W
- IX7 3600W
- IX7 4600W
- IX7 4600W “MERLIN”

The new IX7 generation is easy to identify:

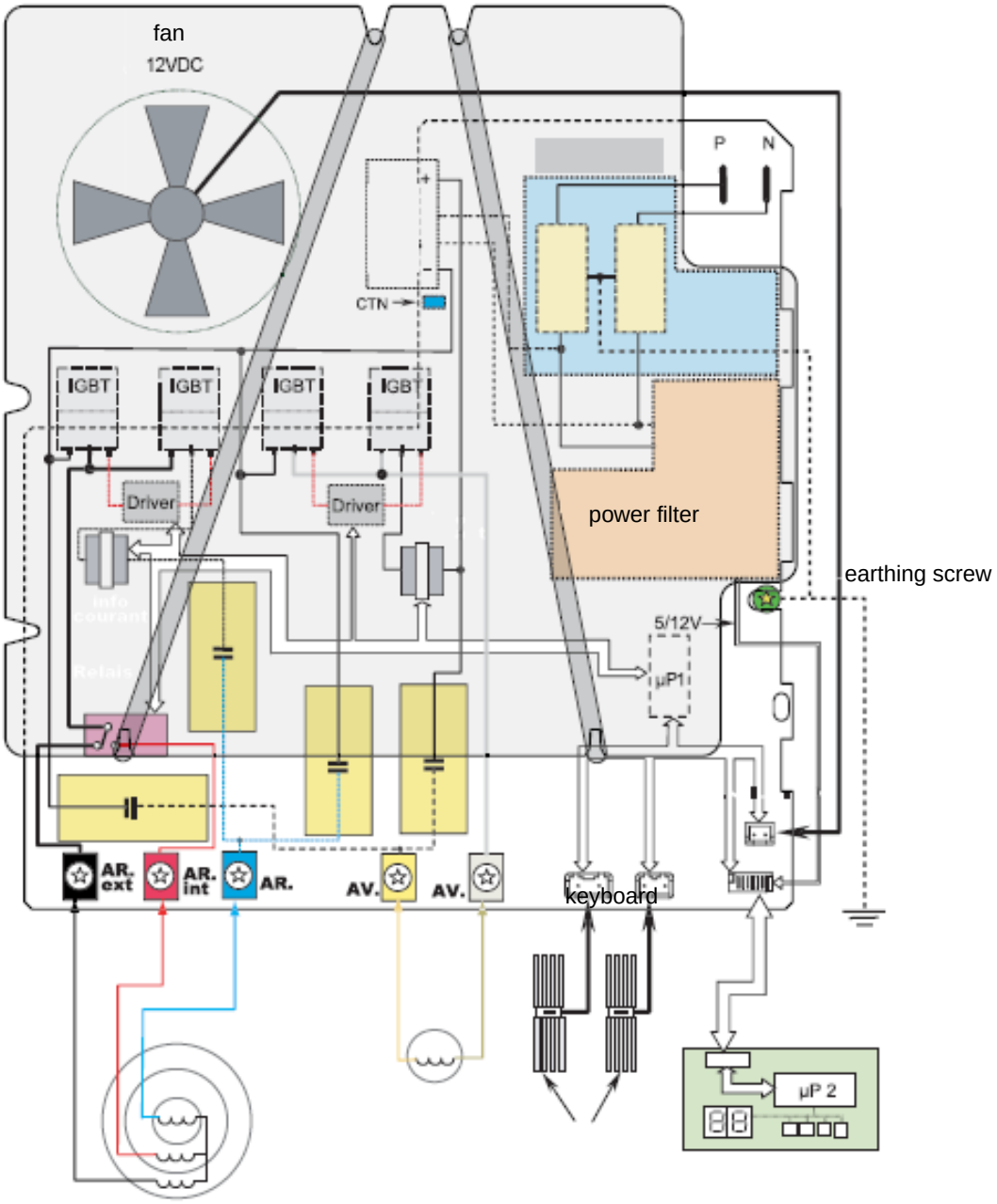
- There is no longer a CMS unit on the bottom of the hob.
- The fan is fastened direct on the consumers.
- The CTN (Varistor) and the fan connection points are on the edge of the card.
- The card has two microprocessors (U1 for power and U2 for safety).



13.2 Internal organization

The filter board is integrated into the circuit board, as with the IX4000.

The fan operates on 12 DC but its voltage can remain below this figure depending on the temperature measured on the circuit board..



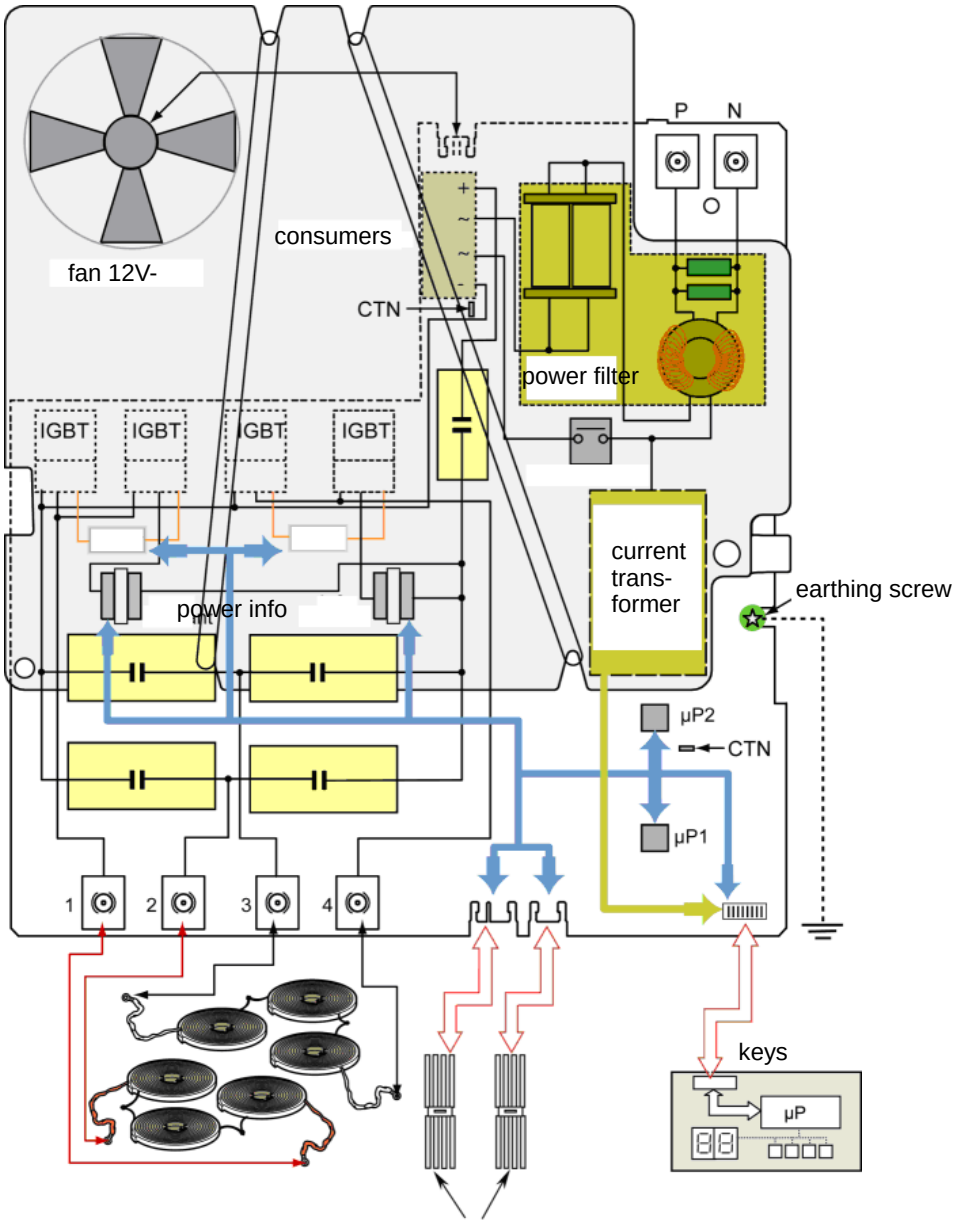
13.3 Description of the circuit

13.3.1 IX7 4600W “Continuum”

1 power filter, 1 safety relay, 1 switching power supply unit, a 12 V fan, directly attached to the consumer, connected on the edge of the board.

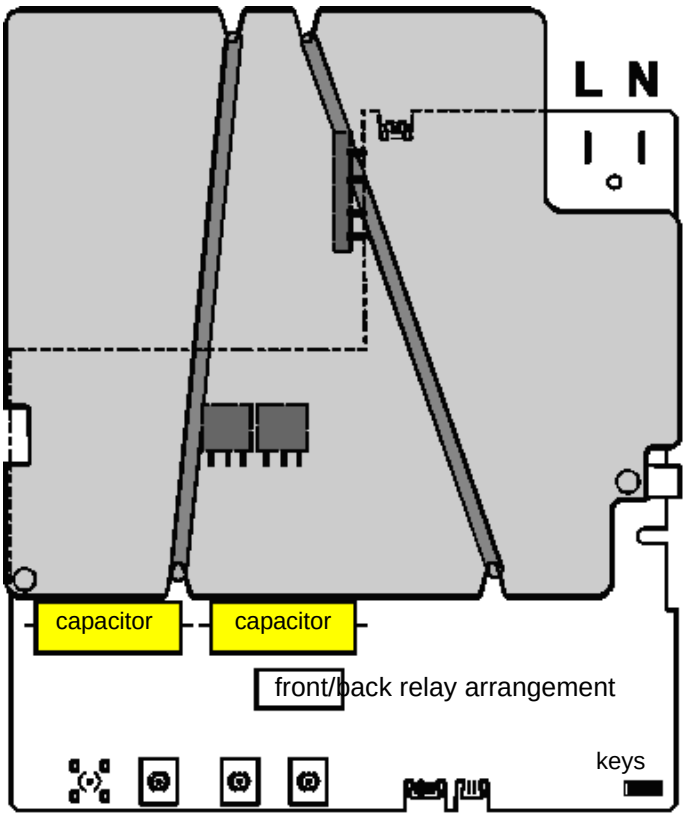
A CTN (R120) flanking the bridge rectifier for regulating the temperature.

The board can be populated with 4 transistors, 2 current transformers and 4 capacitors which may have different values, depending on the model.



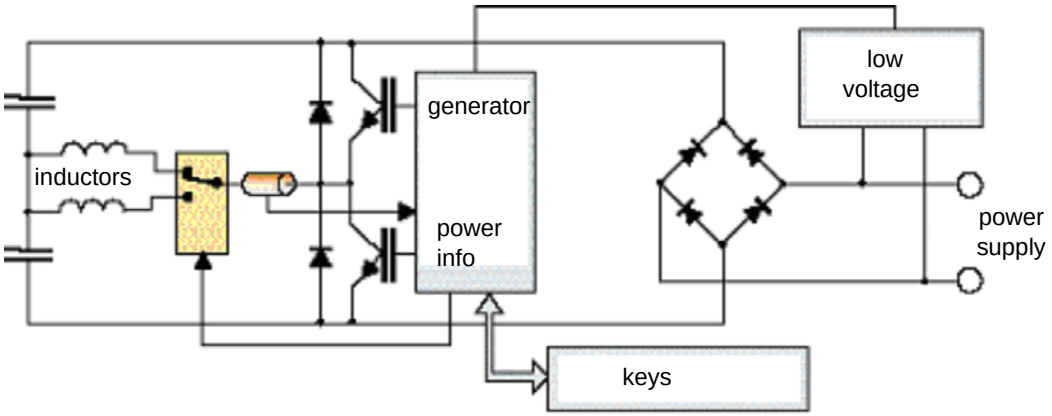
13.3.2 IX7 3100W

This board is identified by means of the 6.35 connector plug receptacles, the front/back relay arrangement, 3 screwed connection terminals for the inductors, 2 capacitors and an Av/AR allocation relay.



Structure

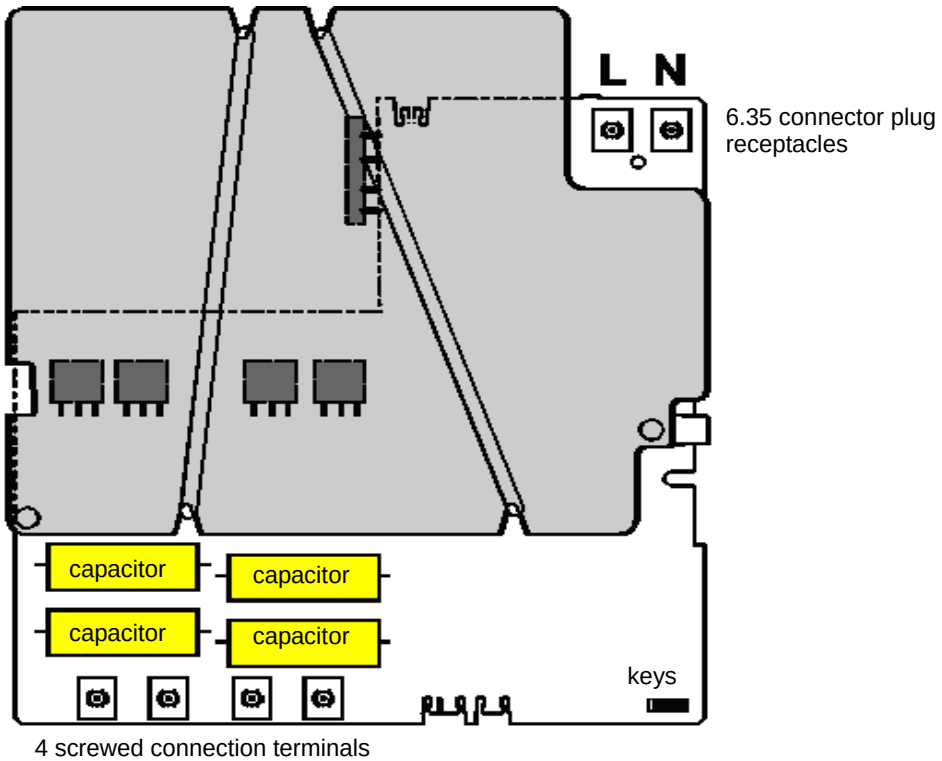
The circuit is structured as follows:



- Integrated bridge rectifier (below the consumer)
- 2 IGBT transistors
- 4 capacitors 0.68 µF
- 2 freewheeling diodes
- A power transformer via an inverter to maintain the pan recognition function
- Front/back arrangement via a relay for regulating the triple-circuit power source

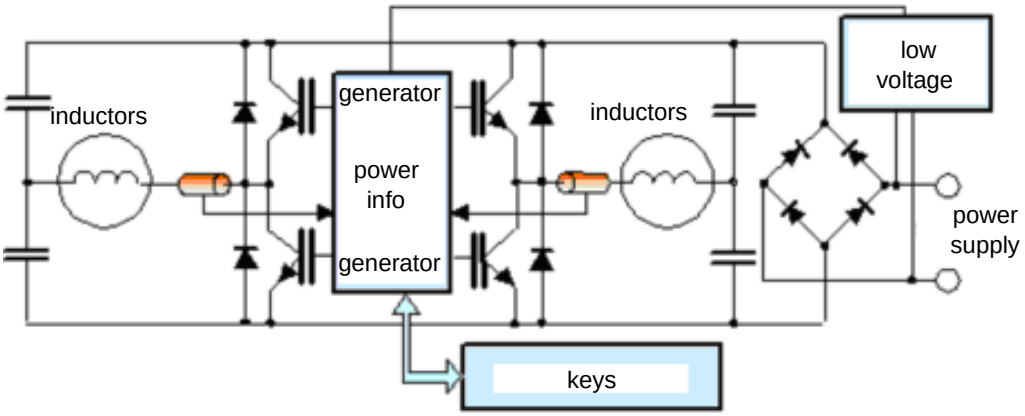
13.3.3 IX7 4600W

This board is identified by means of the 6.35 connector plug receptacles, 4 screwed connection terminals for the inductors and 4 capacitors.



Structure

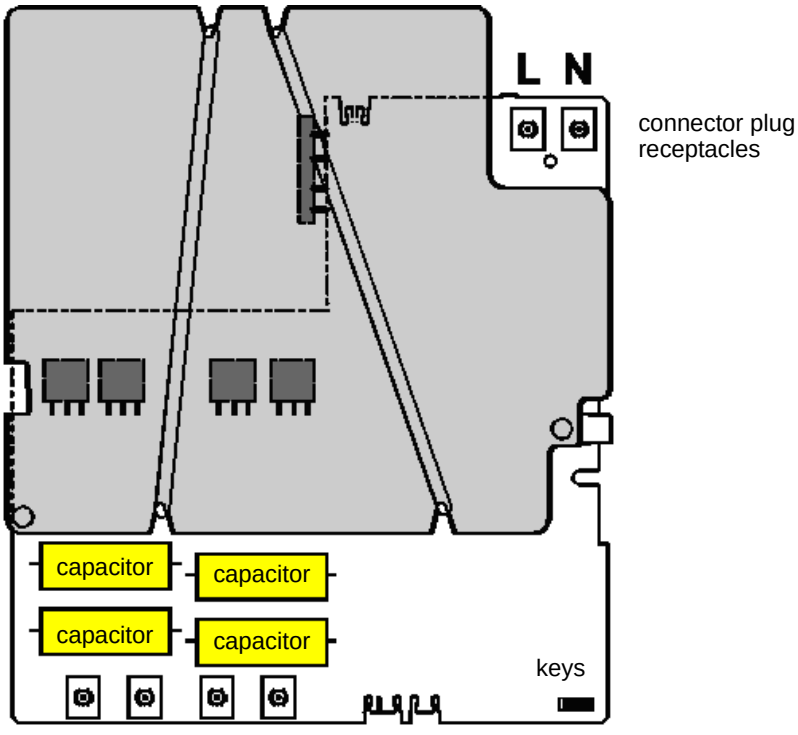
The circuit is structured as follows:



- Integrated bridge rectifier (below the consumer)
- 4 IGBT transistors
- 4 capacitors 0.68 µF
- 4 freewheeling diodes
- Two power transformers via an inverter to maintain the pan recognition function.

13.3.4 IX7 4600W “MERLIN”

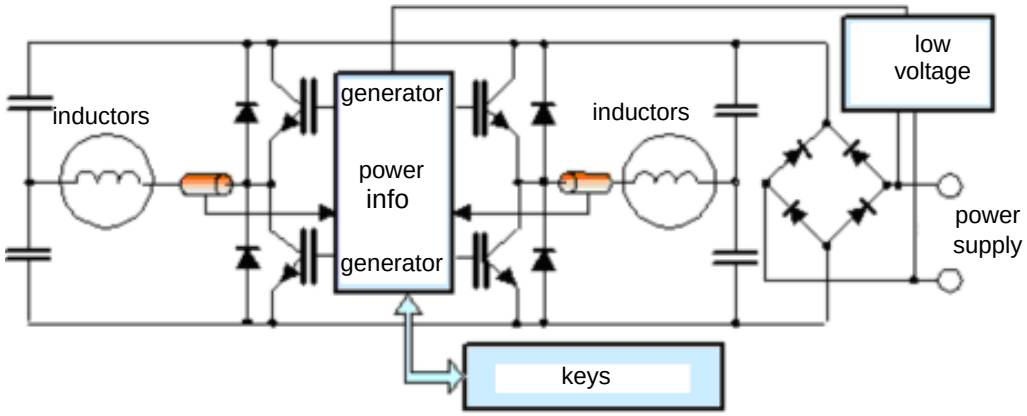
This board is identified by means of the screwed connector plug receptacles, 4 screwed connection terminals for the inductors and 4 0.51 µF capacitors.



4 screwed connection terminals

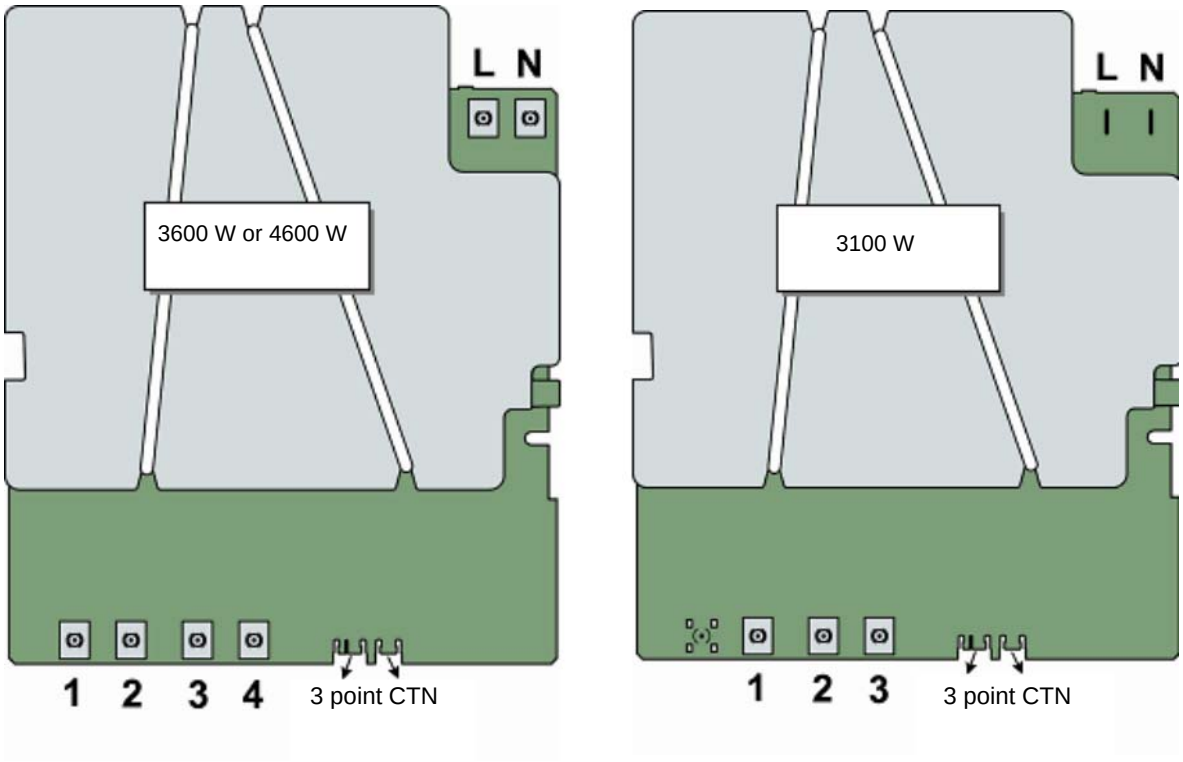
Structure

The circuit is structured as follows:



- Integrated bridge rectifier (below the consumer)
- 4 IGBT transistors
- 4 capacitors 0.51 µF
- 4 freewheeling diodes
- Two power transformers via an inverter to maintain the pan recognition function.

13.3.5 IX7 inductor terminals



14. Error codes

Error codes are a precious aid to diagnostic. Take care to well identify the model to be troubleshooted, as codes do not always have the same meaning.

Code	IX§		IX3WR, IX4000 and IX6	
F0	NTC temperature < 5 °C	Room too cold		
F1 F2	**Front source:** Pb of shorted NTC (F1) or open circuit (F2)	Check the assembly, connection and ohmic value of the NTC.	**Front source:** Pb of shorted NTC (F1) or open circuit (F2)	Check the assembly, connection and ohmic value of the NTC.
F3 F4	**Rear source:** Pb of shorted NTC (F3) or open circuit (F4)		**Rear source:** Pb of shorted NTC (F3) or open circuit (F4)	
F5 F6	**Check of transistors:** Pb of shorted NTC (F5) or open circuit (F6)	Replace the board, as NTC and transistors are interdependent	**Check of transistors:** Pb of shorted NTC (F5) or open circuit (F6)	Replace the board, as NTC and transistors are interdependent
F7	Temperature of transistors > 70 °C and of electronics > 105 °C	Check the installation. Check the ventilation.	**Temperature of electronics** > 70 °C. The message is followed by a crawler until the problem is solved.	Check the installation. Check the ventilation.
F8	Reversal of front and rear NTC's.	Check the crimping of NTC's on their comb, and the right assembly. If they are correct: replace the board.	Reversal of front and rear NTC's.	Check the crimping of NTC's on their comb, and the right assembly. If they are correct: replace the board.
F9	Not applicable		Mains undervoltage Urms < 180V	Mains problem
+ BIP	Not applicable		Continuous pressure > 9s, which results in power cut and hob shutdown If the user acts on a non-covered key, the display is resumed after 1 min with a ‘beep’ every 8s and then stops.	Overflow problem or problem with keys covered by a container or other implement.

14.1 Tests and measurements on IX3, IX3WR, IX4000 and IX6

Where the action on the board is not desired, the diagnostic will be limited to the defective element. Any action on the circuit shall be carried out after eliminating the causes that may be due to saucepans or to a bad installation.

Caution!
To avoid damaging the electronic components, never touch the circuit with your fingers.

Caution!
It is necessary to reinstall the glass-ceramic top to conduct the tests.

14.2 Troubleshooting advice (IX3, IX3WR and IX4000)

It is difficult to supply a troubleshooting chart since causes are numerous. Within the framework of an After-sales Department action, the reasoning will be limited to identify which of the components (Control board, filter board, keyboard, inductor, fan …) is faulty without trying to act on the component itself (Replacement of components).

For each case of failure, it will be advisable to ask the appropriate questions and use the test points provided by this document to answer them.

Control dysfunction

- Is the power board powered?
- Is the power relay (located on filter board) controlled? (IX3 and IX3WR)
- Does the power relay (fan start-up) switch on? (IX3 and IX3WR)

These checks are used to determine which of the 'filter' or 'power' boards is out of order.

Ventilation dysfunction

- In case of ‘overheating error' message, check if the installation is correct.
- Is the fan mechanically locked?
- Is the fan powered? (12 VDC or 230 VAC according to model)

In event of dysfunction on only one inductor

- First, check the connection between power board and inductor.
- Is the distribution relay controlled (Clic-Clac)? (IX3, IX4000)
- Is there a lock-on problem on one of the sources? (IX3WR, IX6)

Note! The ‘inverter and detection’ staged is backed-up on IX3WR and IX6 boards.

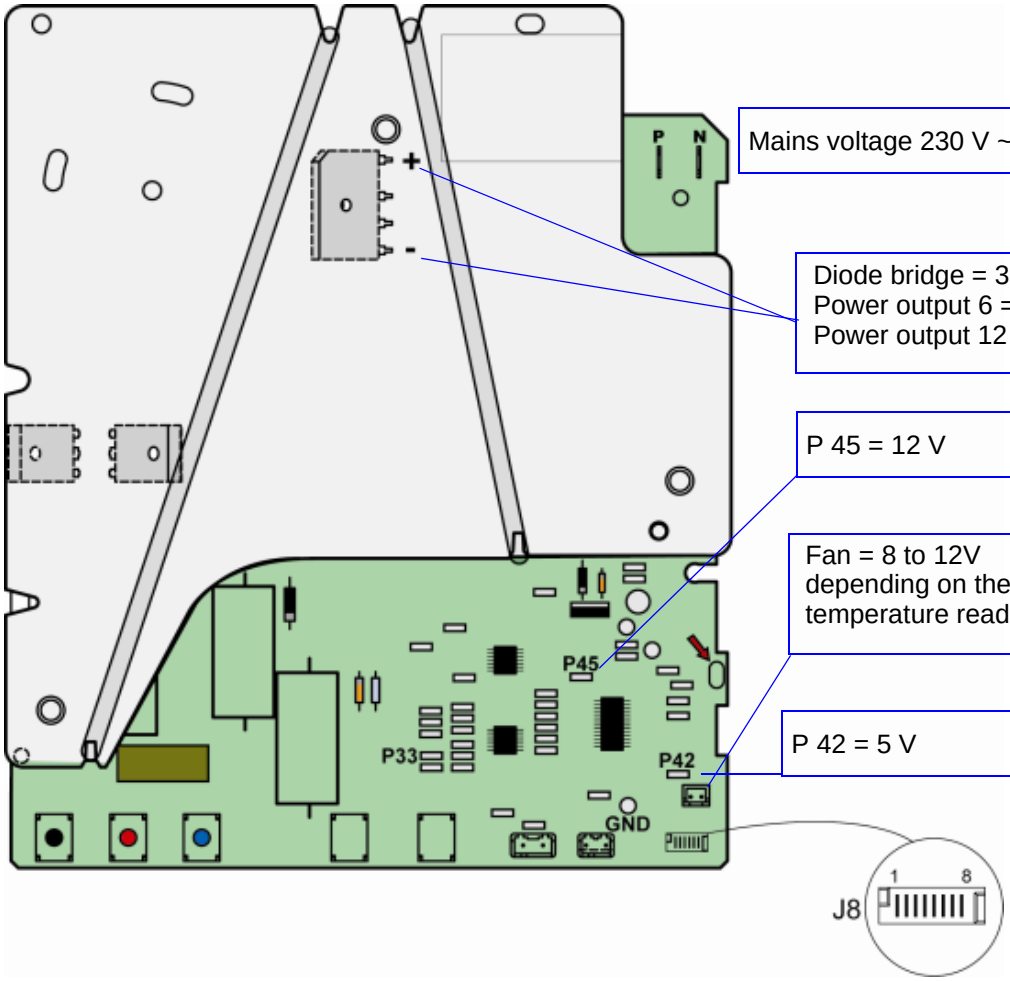
In event of saucepan non-detection

- Does the saucepan pass the magnet test?
- Does the saucepan appear in the ‘Class induction’ list?
- Does the saucepan have the required minimum diameter (12 cm, generally)?

15. Measurements and checks on the power board

Caution!
The board is live!!

15.1 IX 4006



Mains voltage 230 V ~

Diode bridge = 325 V
Power output 6 = 213 V
Power output 12 = 208 V

P 45 = 12 V

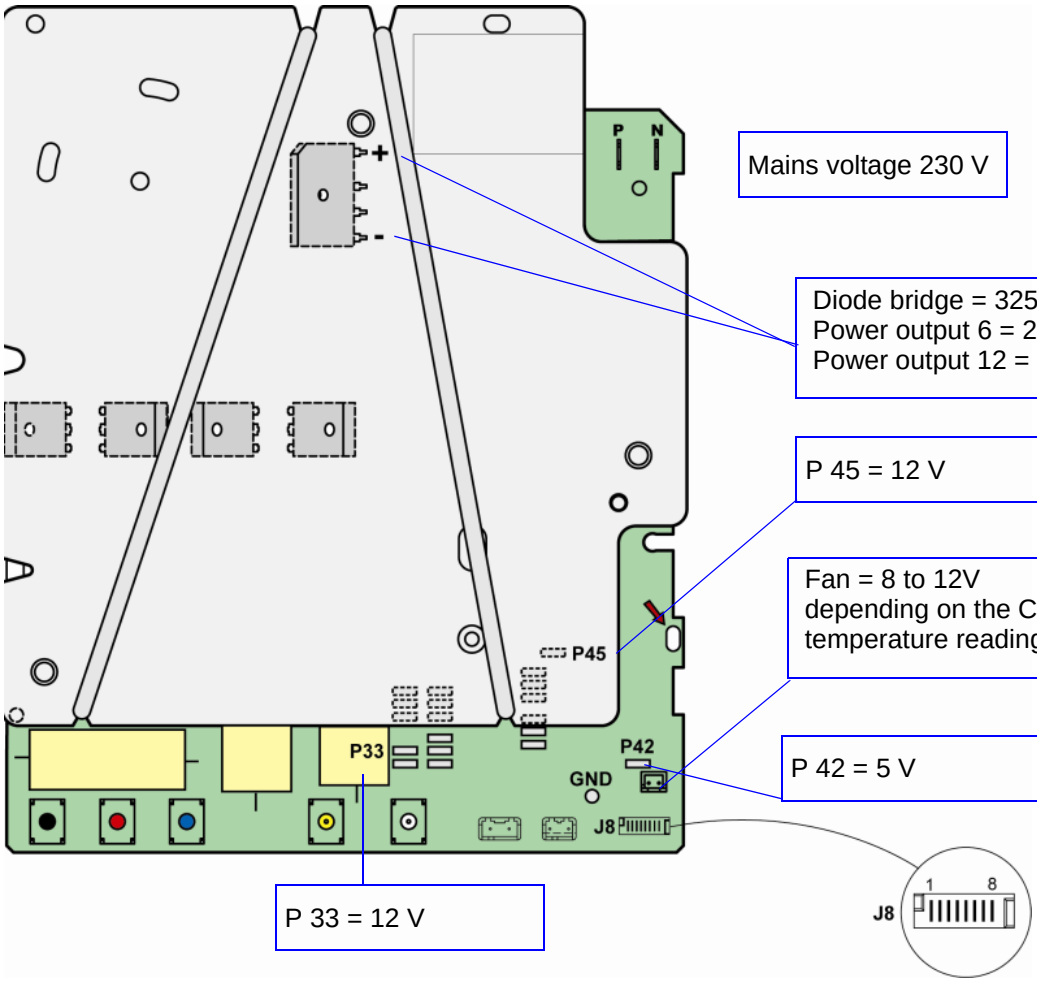
Fan = 8 to 12V
depending on the CTN (R70)
temperature reading

P 42 = 5 V

8 terminals
between plugs 8 and 6 = 12 V
between plugs 8 and 5 = 5 V

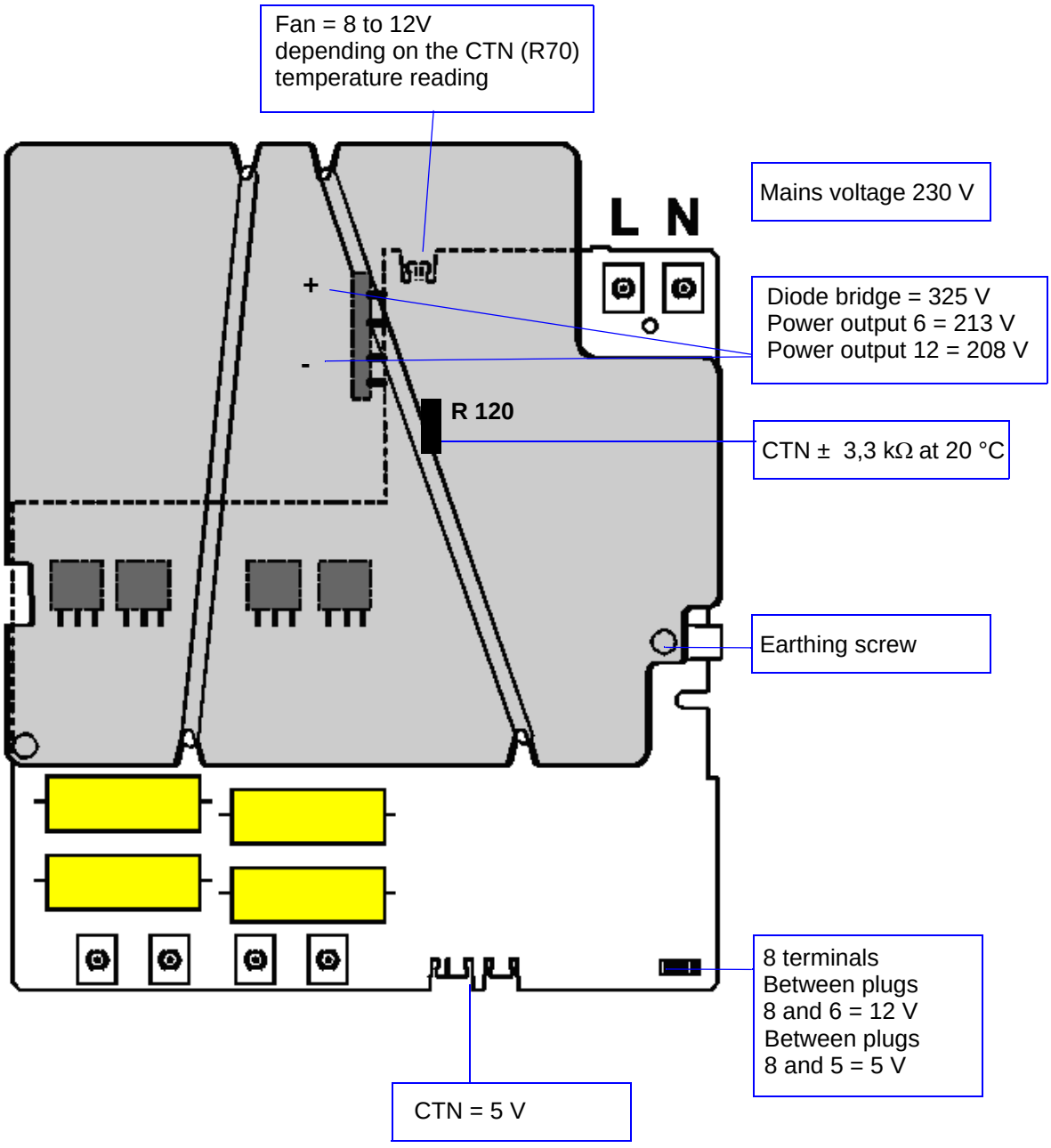
Caution!
The board is live!!

15.2 IX 6



Caution!
The board is live!!

15.3 IX 7



16. What to do if...

16.1 ... there is a smell of burning when the appliance is switched on?

Cause

When the insulated wire of an inductor is plugged into a terminal, the insulation of some of the bronze radiant elements may have not completely glowed away or the radiant elements may not have snapped in properly.

This means that the cross intensity is concentrated on the other radiant elements that do not heat up normally.

The colourless coating burns over the full length and causes a smell of burning.

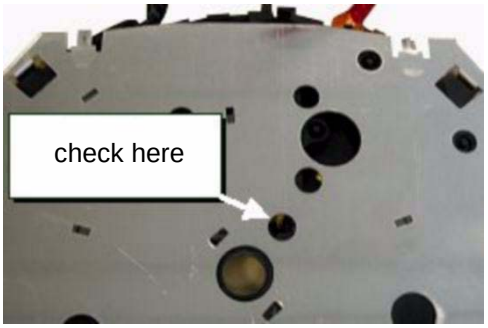
Solution

If this smell of burning occurs in an inductor, it will need to be replaced.

16.2 ... the pan recognition device does not function or is reset for no reason?

Cause

An insulator located under the inductor segregates the bronze of the inductor from the power circuit board. If this insulator is not present or if it has not been properly installed, problems with the pan detection device will occur or it will reset.



Questions

- Does the pan react to the magnetic test?
- Is the pan suitable for induction?
- Does the pan have the required minimum base diameter of 12 cm?

Solution

If the bronze wire on the back of the circuit board is visible, there is no insulator and it will need to be replaced.

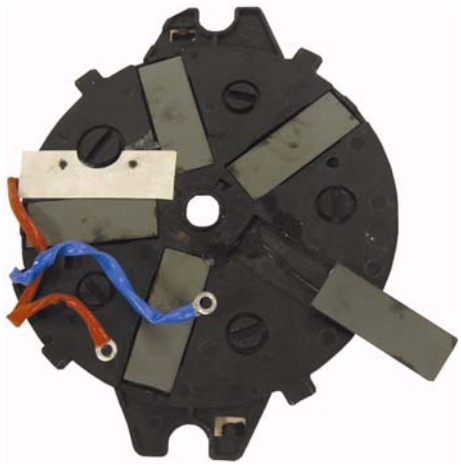
16.3 ... a cooking zone switches off unintentionally?

- The electronic unit of the IX7 accepts a minimum mains voltage of 200 V. Falling short of this voltage will cause the cooking zone to switch off.
- The electronic unit of the IX7 Continuum accepts a minimum mains voltage of 205 V. Falling short of this voltage will cause the cooking zone to switch off.

16.4 ... vibration noises can be heard?

Cause

Depending on the power level selected, the inductor may make a noise when connected to the mains. This noise is caused by the ferrites snapping under the inductor.



Solution

These noises are normal and require no remedy.