

Induction hobs
EKI 6130 / 6140
G1 Series

Configuration and failure codes

Service Manual: H1-53-01

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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! Prior to repairs, disconnect the appliance from the mains!
- 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 ground wire resistance must not exceed that specified in the standard! It is vital for ensuring the safety of persons 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! On completion of repairs, a function and impermeability inspection must be carried out.
- Do not touch any of the components in the appliance. The modules are also live!
- Observe instructions on electrostatic hazards!



Attention!

It is essential that 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 circuit breaker.



Sharp edges: Use protective gloves.



**Components may be electrostatic!
*Observe handling regulations!***

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.

Since the middle of the 20th century induction started being used as a heating means. 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. Introduction

The aim of the present document note is introducing the new G1 range of induction hobs, showing the main features, its configuration mode and the error messages that could appear during the normal use of the end customer.

Besides it, it is given a brief explanation about how to substitute some of the most important components during the reparation procedures.

5. User interface (USIF)

5.1 Performance of the user interface

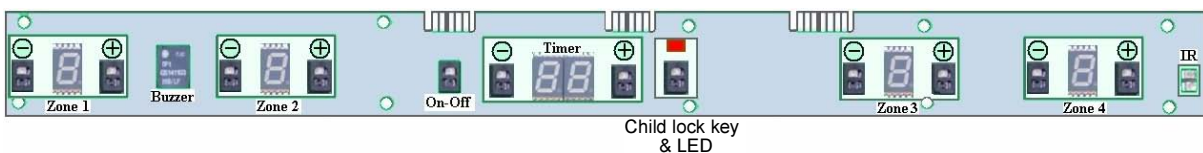
The USIF is an infrared Touch Control system. It works at a nominal voltage of 230 VAC with a tolerance of +10% / - 15%.

A brownout is defined as a condition where line voltage drops below 196 VAC for a duration less than or equal to 3 seconds nominally. A disturbance may continue to be treated as a brownout for up to 10 second duration dependent on the tolerances of the detection/recovery method.

The control will return to the operational state it was in prior to the disturbance when line voltage returns to normal. A power failure is defined as a brownout with minimum 3-second duration. A power line disturbance meeting the above mentioned voltage criteria may continue to be considered a brownout for up to 10 seconds in duration dependent on the tolerances of the detection/recovery method. At no greater than 10 seconds' duration of the aforementioned power line disruption the disturbance will be considered a power failure. A line disturbance meeting the criteria necessary to be considered a power failure shall result in the control returning to its initial power on state and showing a failure message.

5.2 USIF different layouts

The user interface foresees the following options:



Option 1

- 4 induction zones with +/- keys on each zone, no timer, child-lock (led to indicate the lock state), IR port for configuration, buzzer

Option 2

- 4 induction zones with +/- keys on each zone, 2 digit timer with +/- keys, child-lock (led to indicate the lock state), IR port for configuration, buzzer

Option 3

- 3 induction zones with +/- keys on each zone (zone 4 is missing here), 2 digit timer with +/- keys, child-lock (led to indicate the lock state), IR port for configuration, buzzer

Option 4

- 3 induction zones with +/- keys on each zone (zone 4 is missing here), no timer, child-lock (led to indicate the lock state), IR port for configuration, buzzer

Option 5

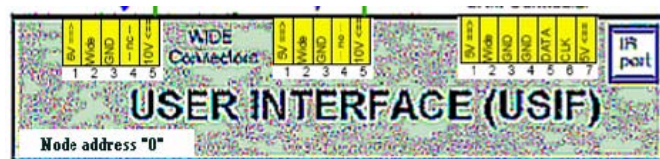
- 3 induction zones with +/- keys on each zone (zone 1 is missing here), 2 digit timer with +/- keys, child-lock (led to indicate the lock state), IR port for configuration, buzzer

Option 6

- 3 induction zones with +/- keys on each zone (zone 1 is missing here), no timer, child-lock (led to indicate the lock state), IR port for configuration, buzzer

6. Communication and connectors

On the USIF there will be two WIDE connectors, for the communication between each IPC (Induction Power Converter) and the USIF, a SAM connector (for service maintenance) and an Infrared port (IR).



7. System failures

7.1 Failure types

Regarding the system there are four types of failures depending on their gravity and the impact they may have on the behaviour of the appliance:

7.1.1 Failure type 1

These failures are the ones that affect only one cooking zone. The user may continue using the other cooking zones. When this type of failure occurs then USIF becomes insensitive to the subsequent changes of settings on that cooking zone. If the user presses the buttons related to the defective zone then a long beep is emitted.

Every failure type 1 (that concerns one cooking zone only) is only shown on the display of that cooking area. Supposing to have the error coded with F21 on zone #1, then it will be shown intermittently an "F", a "2" and a "1" on that display. (See pictures below - Each frame is shown for one second on the USIF.)



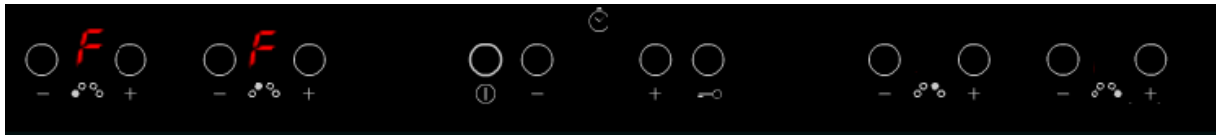
7.1.2 Failure type 2

Failure type 2 usually comes from IPCs (there could be some exceptions). These failures affect the whole IPC, in any case the user could go on using the cooking zones that belong to the other IPC.

When this type of failure occurs the USIF becomes insensitive to subsequent changes of settings on that IPC. If the user presses the buttons related the IPC where the failure is, then a long beep is emitted.

Every failure type 2 (that concerns one IPC only) is shown on the displays that are associated to that IPC.

Every failure type 2 (that concerns one IPC only) is shown on the displays that are associated to that IPC. Supposing to have the error coded with F23 for the IPC1, it will be shown intermittently "F F" and "2 3" on those displays. (See pictures below - Each frame is shown for one second on the USIF.)



7.1.3 Failure type 3

Failure type 3 comes from the USIF. These failures do not allow the user to utilize the whole hob. When this type of failure occurs the USIF switches OFF all the cooking zones present on the hob sending down power levels equal to zero, and it becomes insensitive to subsequent changes of settings on the whole hob. If the user presses the buttons related to any one of the zones, then a long beep is emitted.

Every failure type 3 concerns the whole hob. It is shown on all the displays.

Supposing to have the error coded with F31, it will be shown intermittently "F F F F", "3 3 3 3" and "1 1 1 1". (See pictures below - Each frame is shown for one second on the USIF.)



Every failure is shown on the USIF when it occurs. If the failure does not occur anymore then the hob starts to work regularly.

8. Failure 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. In the following table there are gathered the codes and detailed descriptions, showed in the USIF, of the failures that could happen in the appliance from the IPC side.

The code to be shown on the display is reported with an 'F' before (or a 'C' for failure number > 80), this is just to distinguish these two codes.

Code	Type of failure	Failure description	Possible solution
<i>F12</i>	1	IPC error (low current in coil)	If persistent, change IPC.
<i>F21</i>	External cause	Mains frequency wrong.	Verify mains frequency.
<i>F25</i>	2	Fan stuck on IPC #	Change fan.
<i>F36</i>	1	Coil # temperature sensor shortcircuited. NTC value is out of the specified range.	Change coil.
<i>F37</i>	1	Wrong connection or NTC unconnected.	Review connection – Change coil.
<i>F40</i>	1 or 2	IPC error.	Change IPC.
<i>F42</i>	External cause	Mains over voltage.	Verify mains voltage.
<i>F43</i>	External cause	Mains low voltage.	Verify mains voltage.
<i>F47</i>	2 or 3	Communication between USIF and all the IPCs is not working.	Verify mains voltage.
<i>F56</i>	3	Wrong or invalid USIF configuration.	Repeat configuration.
<i>F58</i>	2	Wrong or invalid USIF configuration.	Repeat configuration.
<i>F60</i>	3	USIF error.	Change USIF.
<i>C81</i>	2	Board overheated.	Let it cool down.
<i>C82</i>	2	Coil overheated.	Let it cool down.

Note: On hobs with TC software version prior to 3.30, it may occasionally happen that the residual heat indicator 'H' keeps fixed after the glass has cooled down. In such a situation like this, the 'H' is removed by simultaneously touching "+" and "-" keys corresponding to that heater.

9. Configuration and test mode

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.

There are two equivalent ways to run the test and configuration mode:

- Using the dedicated SAM connection.
- Manually, using the touch keys of the appliance.

In fact, for service purposes, it is advisable to use the USIF keys to run this “test and configuration” mode. It will be possible to re-configure the appliance even without a specific tool.



Every time the USIF or/and an IPC is changed, it is mandatory to reconfigure the whole hob after the repair. Otherwise, the hob will not work correctly!



Attention!

It is advisable to avoid strong lights (like halogen from hoods) focused on the USIF during the FIRST connection to power supply. In such situation, USIF needs some seconds to calibrate its keys, and strong lights might disturb this activity.

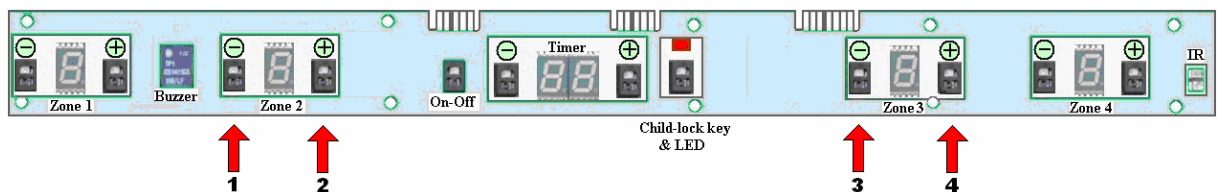
9.1 Access to the “Test and configuration Mode”

1. UNPLUG the hob from the mains and wait for ten seconds.
2. Plug in the appliance to the mains, energizing it. All the segments and decimal dots of the displays and all the LEDs present in the USIF will be switched ON for two seconds and then switched OFF. Subsequently the buzzer will beep once for 1 second.
3. During a timeout subsequently activated (it will last 60 sec) the test mode will be accessible by pressing a key sequence combination. If no key is pressed within this timeout, then the appliance will remain in STAND-BY mode.



If the ON/STAND-BY button is touched within this timeout then the appliance will start its usual behaviour. In this case you need to return to step 1 to make the configuration.

4. Perform the following key sequence:
minus key (zone 2) -> plus key (zone 2) -> minus key (zone 3) -> plus key (zone 3).



Each touch must be recognized with a beep from the buzzer. If the key sequence is wrong, the buzzer will emit three standard beeps and then the sequence must be introduced again. After the first touch, the whole sequence must be completed in less than 5 seconds.

5. If the process has been done correctly the decimal dot of zone 2 blinks for a few seconds, and the message "C O" is then showed on displays cooking zones 2 and 3. The system uses always displays cooking zones 2 and 3 to show information. These two zones are present in USIF with three and four zones.
6. To cancel the test mode press the ON/STAND-BY button. Leaving the test mode the buzzer will beep once (standard beep) and the appliance will go into STAND-BY mode.



Hobs with software version "2.XX" in USIF do not include the configuration menu.

9.2 Main menu

Once the right test sequence is introduced the USIF will enter the main menu providing the following options:



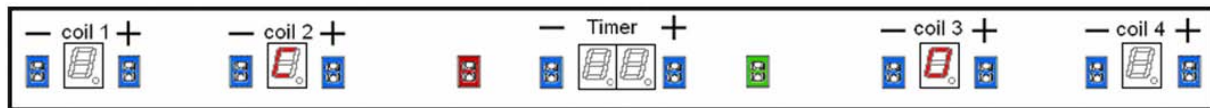
Configuration

Checking - To show these two letters the USIF will use the cooking zone displays 2 and 3.

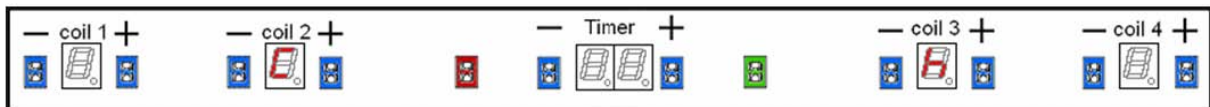
Information

If the test mode is active a timeout will be present (60 sec) when no key is touched. If this timeout elapses without touching any key a beep signalize TEST MODE is finished and the appliance will go to STAND-BY mode.

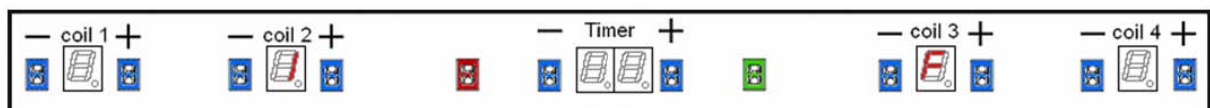
Configuration mode (CO)



Checking mode (CH)



Information mode (IF)



9.2.1 Swapping between modes

To switch from one mode to another is possible by using (-) / (+) keys of the cooking zone 2.

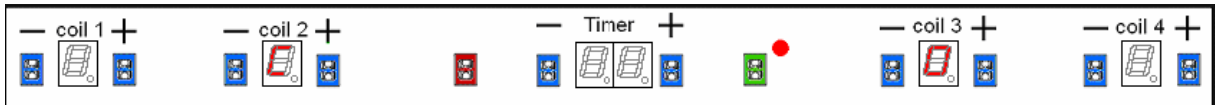
- Pressing (+) key it will be possible to shift between:
CO -> press (+) key => CH-> press (+) key => IF
- Pressing (-) key it will be possible to shift between:
IF -> press (-) key => CH-> press (-) key => CO

9.2.2 Access to one of these modes

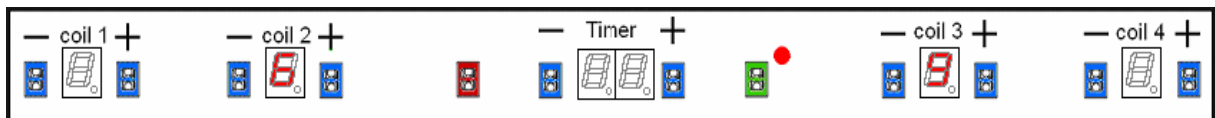
Once the display is showing CO, CH or IF, to enter into one of these three modes it is necessary to press the CHILDLCK key. As general performance CHILDLCK key is a button that works as <enter>, confirming the current option.

9.2.3 Configuration mode

Configure the appliance means: "choose the proper configuration for the USIF and for each IPC present in the hob". In this mode the operator can configure the whole system from the USIF. To enter into this configuration menu it is necessary to press the Child/lock button when CO is shown on the displays.



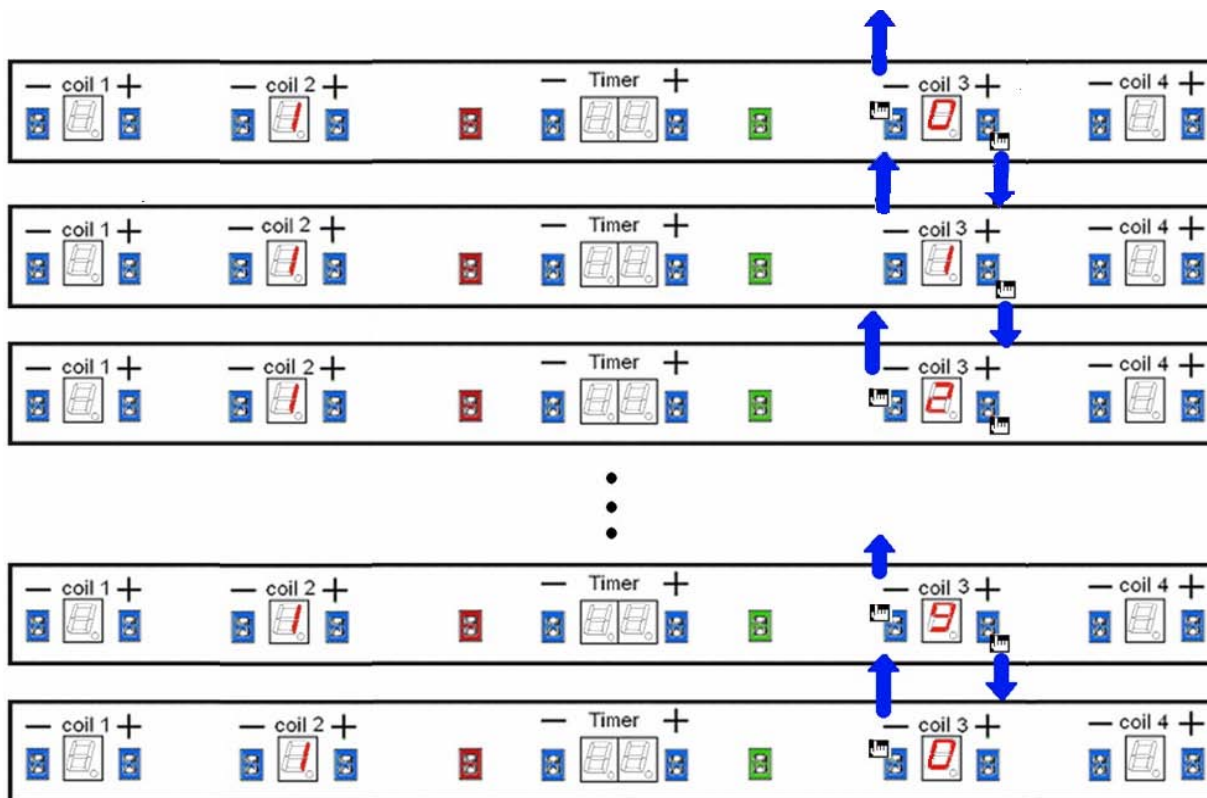
Once this configuration sub-menu (CO) is acceded, 70 different hob configurations already stored in the EPROM of the USIF will be available. For choosing one of these configurations, (+) and (-) buttons of cooking zones 2 and 3 will be used, as it is shown in the next picture.



It is possible to see different numbers on the display, which sequentially moves from 00 to 69. The following pictures show how to move inside the sub-menu of the configuration. It is possible to use the relative (+) and (-) buttons to increase the units or the tens.



This previous pictures show how to change the tens, whilst the following one shows how to change the units.



Once the right configuration number is chosen, then pressing CHILD LOCK it will be confirmed and downloaded inside the hob. The decimal dot of zone 2 blinks for a few seconds, while downloading. Finally the USIF goes, automatically, to checking mode. By using ON/STAND BY button the menu is left and the appliance will start its usual behaviour.

9.2.4 Configuration numbers and models

Config. no.	Model	Features
35	IR / IT 641	Hob with 4 cooking zones with timer
45	IR / IT 631	Hob with 3 cooking zones (145+210+dual right) with timer
47	IRC 631	Hob with 3 cooking zones (145+180+dual right) with/without timer
48	IR 630	Hob with 3 cooking zones (145+180+dual right) with timer



Once inside "Configuration mode" (CO), in case it is not possible to configure the system because one of the boards refuses to accept the configuration, a failure "EE" will be displayed for 5 seconds on the displays instead of "CO", and a constant beep will be emitted. Then the menu CO is possible to be entered again.



IMPORTANT !!!

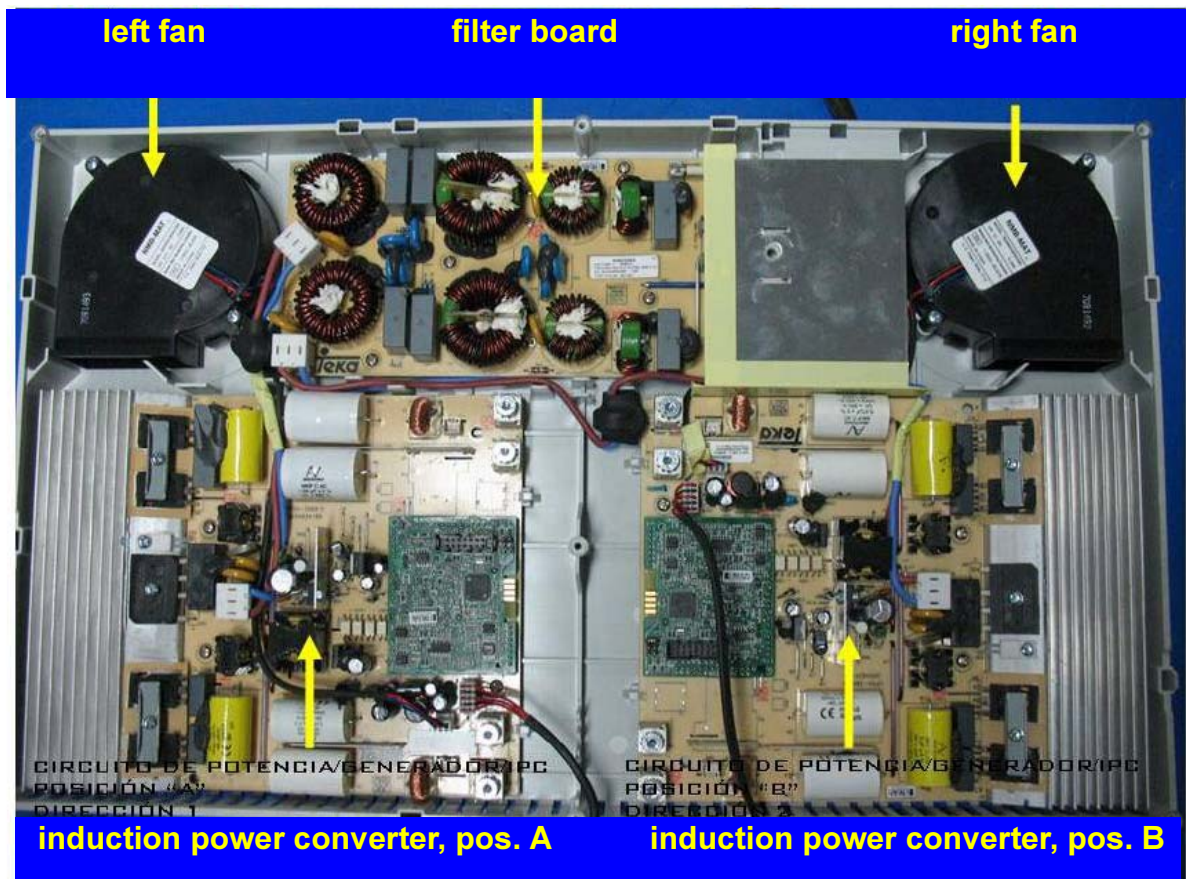
After leaving Configuration Mode it is compulsory to reset the USIF in order to update the stored configuration. In order to do that, you have to UNPLUG the hob from the mains and wait for ten seconds before plugging it again.

After plug-in, in case there is a wrong configuration, we will see an error message "F XX".

10. Remarks for service activities

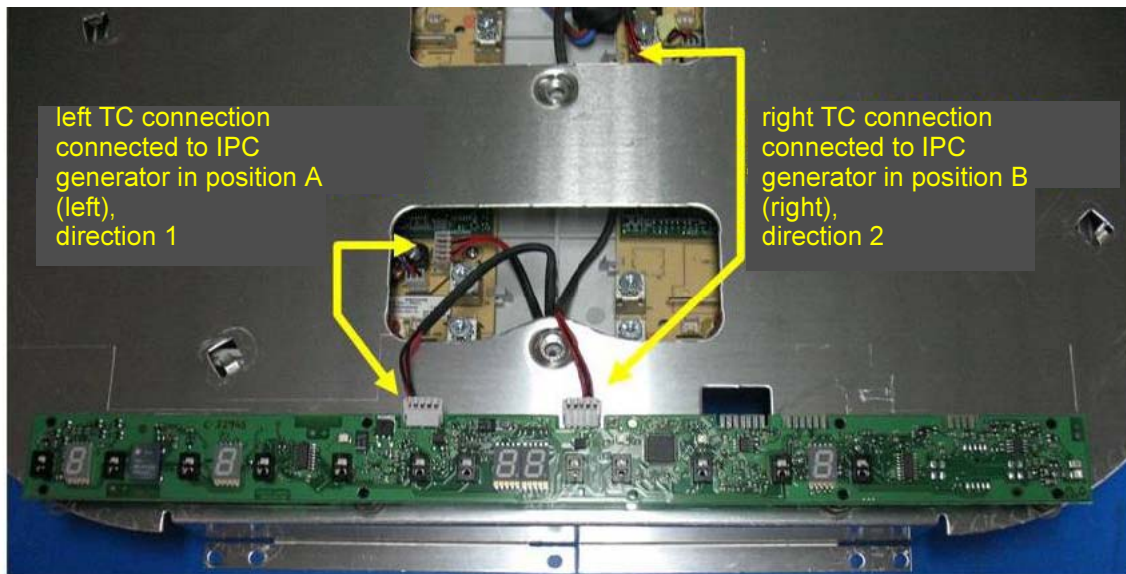
In the following section are included some important remarks that shall be considered when changing some parts of the system. Next picture shows a general view of the induction module, together with the name given to each component.

10.1 General view of the induction module

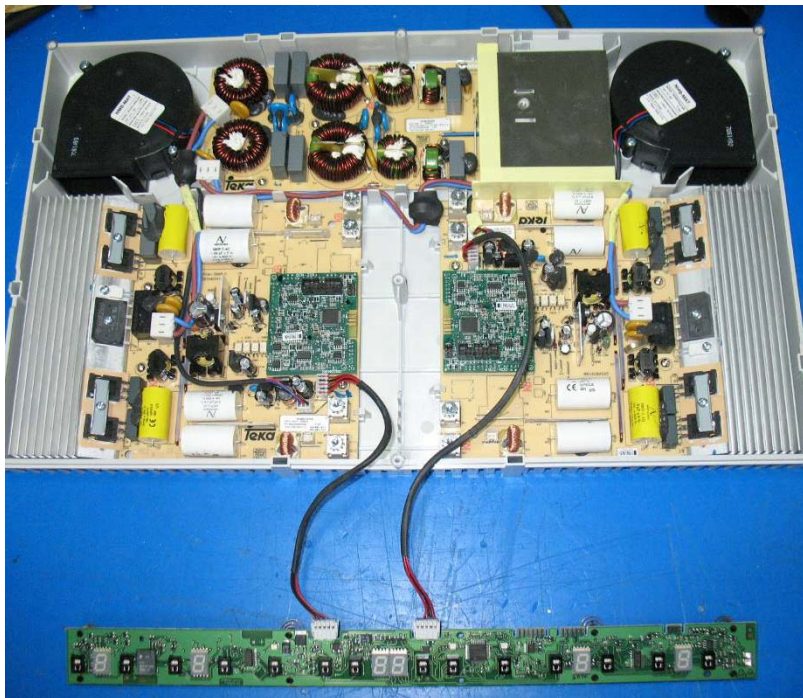


10.2 Substitution of the Touch Control

When changing a defective TC for a new one, it should be taken special care on the right connection of the cables from IPCs to TC, as shown in the next picture.



Connection of communication cables



Each time a TC and/or IPC(s) is/are changed during service intervention, it is compulsory to perform the configuration of the hob. Otherwise the system might not work properly.

10.3 Substitution of IPC

10.4 Types of IPCs (LS & SS)

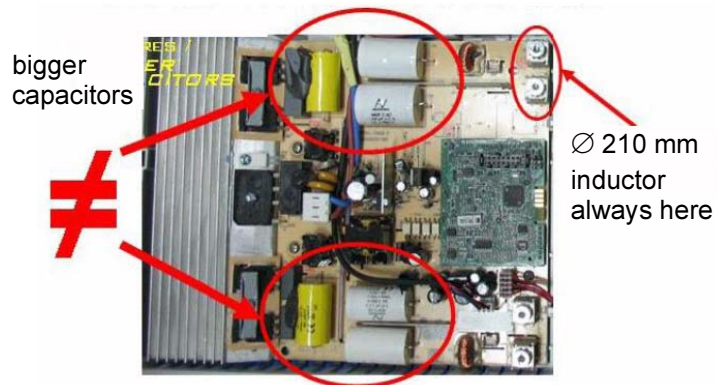
There are 2 different configurations for IPCs, depending on the so-called resonant capacitors (res caps). We call them configuration LS or SS.

Configuration LS has different size of res caps pair. One pair is bigger than the other one. The bigger pair is intended to drive only a coil of diameter Ø 210 mm. **So a LS IPC has to be used each time a Ø 210 coil is to be connected.**

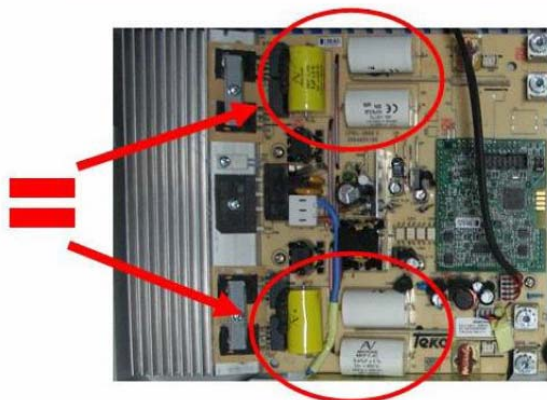
Configuration SS has same size and kind of res caps (small). The small pair of res caps is intended to drive coils of diameter Ø 145, Ø 180 or dual (Ø 260). **A SS IPC has to be used when coils different to Ø 210 are to be connected.**

Next pictures show details of the explanation given above. It should also be considered that the dual coil (Ø 260 mm) needs a special wiring sequence that is explained later. For the other coils, the 2 wires can be connected to any of the 2 metallic "towers" corresponding to the suitable channel inside the IPC.

IPC with LS configuration



IPC with SS configuration



10.4.1 Position of IPCs inside the induction module

A standard induction module includes 2 IPCs that can be placed in 2 different positions or addresses. Position **A** means address 1, and position **B** means address 2, as shown in figure "Configuration mode (CO)" on page 12. When changing one IPC, it should be taken care that the correct address is assigned.

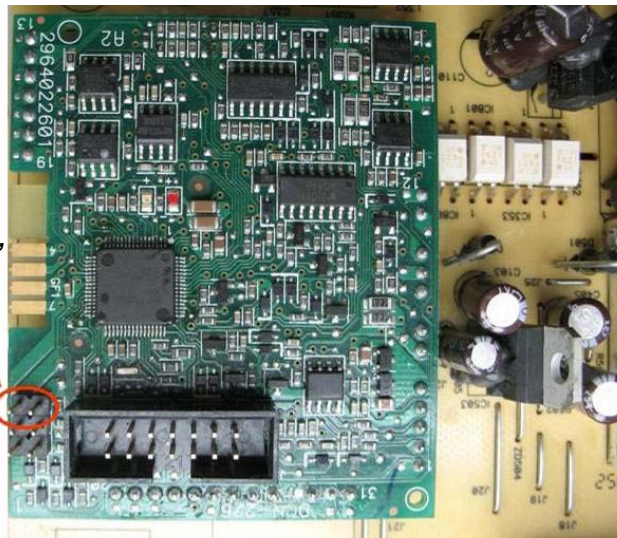
In order to identify address 2, the IPC placed in position "B" **MUST** include a jumper in connector J6P as shown in the figure on page 13. No jumper placed means address 1, so IPC placed in position "A" needs no jumper.



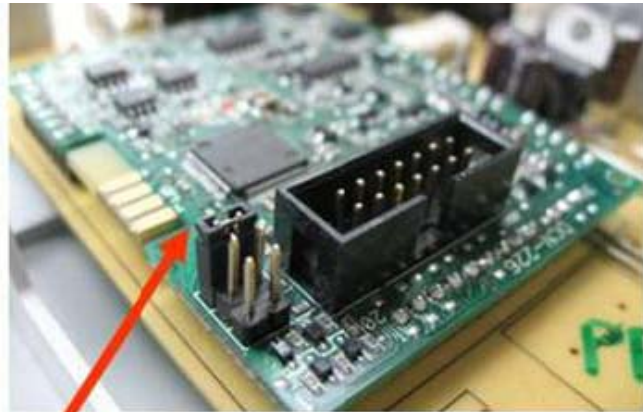
IPC in position "A" needs NO jumper.

IPC in position "B" needs jumper. Otherwise the system will not be configured properly!

*jumper
connected in
J6P for an IPC
in position "B"
(adress 2)*



Connector J6P



jumper connected in J6P for IPC in position "B" (adress 2)



Each time a TC and/or IPC(s) is/are changed during service intervention, it is compulsory to configure the hob. Otherwise the system might not work properly.

10.5 Substitution of a coil

10.5.1 Coils

There are 4 different coils, depending on their diameter: 145, 180, 210 and 260 mm. The last one is a dual coil (inner and outer), so it includes 4 wires for power supply, but only one wire for temperature sensor. The others are "single" coils, and include only 2 wires for power supply, and one for temperature sensor.

Single coils needs no additional care when changing: simply connect each of the 2 power wires in each of the 2 metallic "towers" placed on the IPC board, while the temperature sensor is connected in its connector near the "towers".

Substitution of a dual coil is described in the following section.

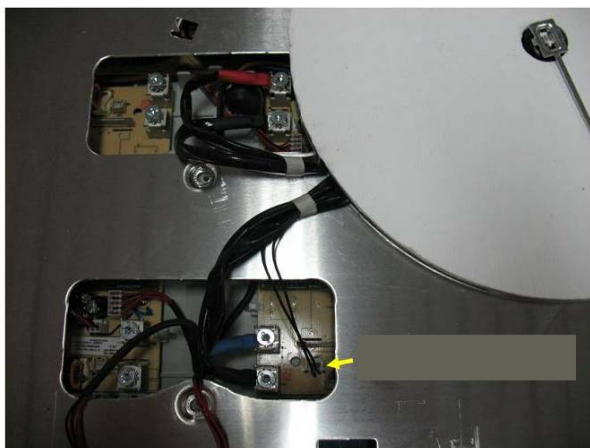
10.5.2 Substitution of a dual coil

One IPC can drive either 2 single coils, or only 1 dual coil. A dual coil has 4 power wires that must be connected following a specific way. Also the temperature sensor has to be connected to a specific connector.

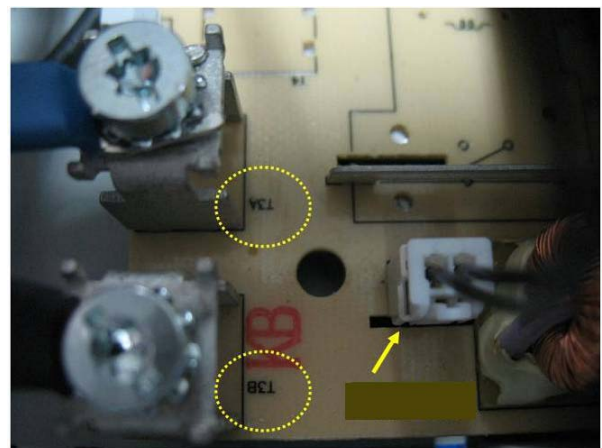


When connecting a dual coil, the temperature sensor (NTC) must be connected in channel 2 inside the IPC, that means, in the connector J605 near towers T3A and T3B.

The other connector J604 near towers T2A and T2B (channel 1) must be left free. Details are shown in the next pictures.



Sensor connection to channel 2



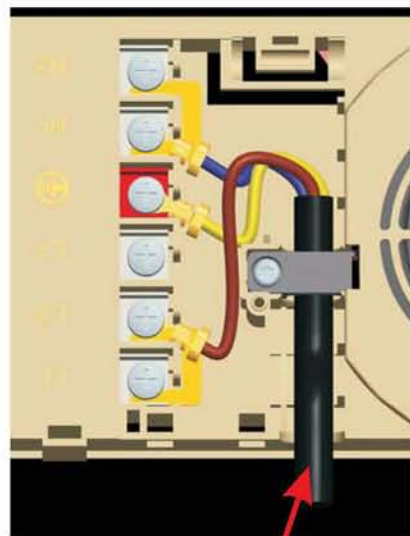
Detail



**VISTA EN POSICIÓN DE
MONTAJE DE LA ENCIMERA**

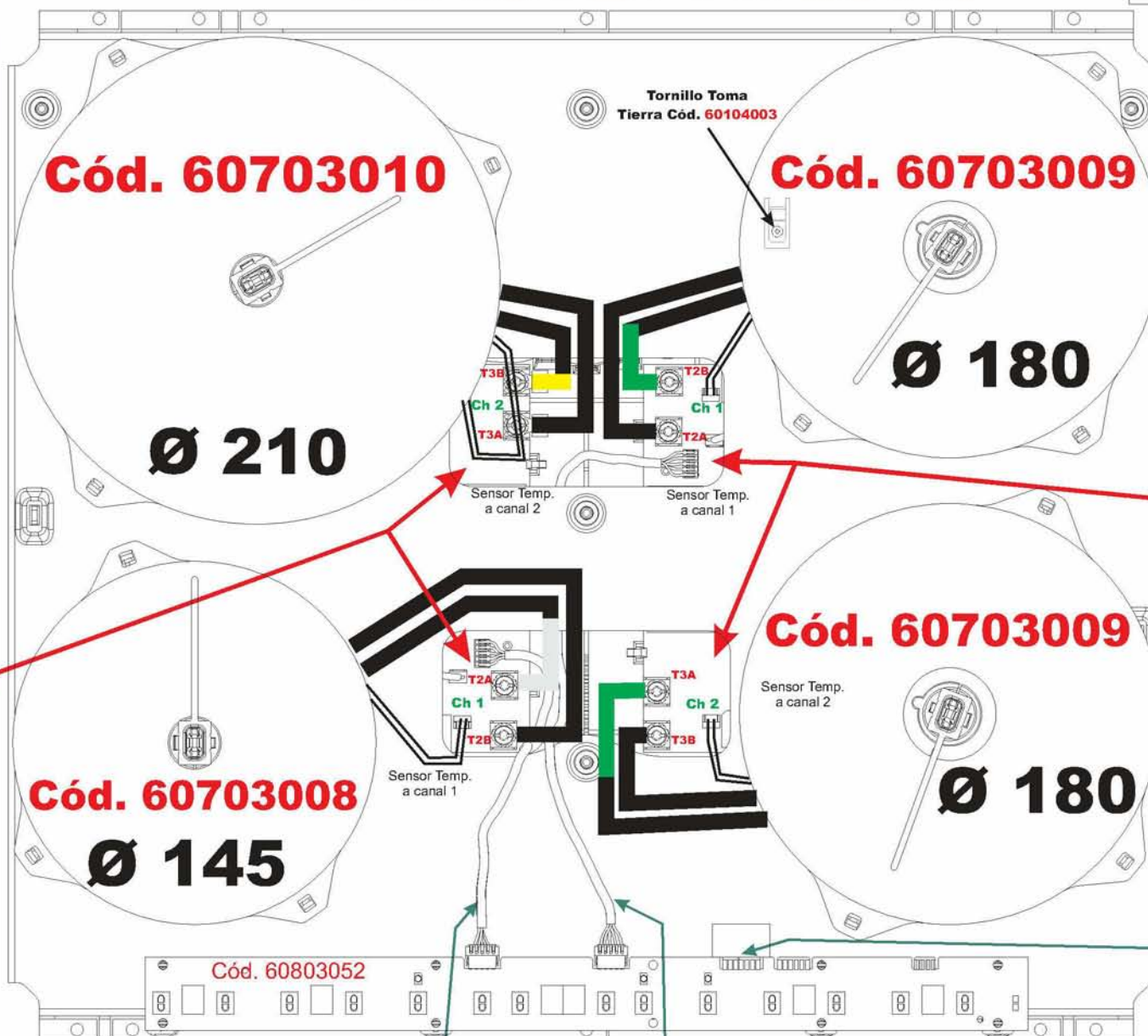
**EKI 6140_0 /
IR 641 / IT 641 /
TTI 604 B / TTI 604 R**

**BY 13745c
25/02/09**



Cable de red
Código 60903997

IPC Posición "A"
Dirección 1

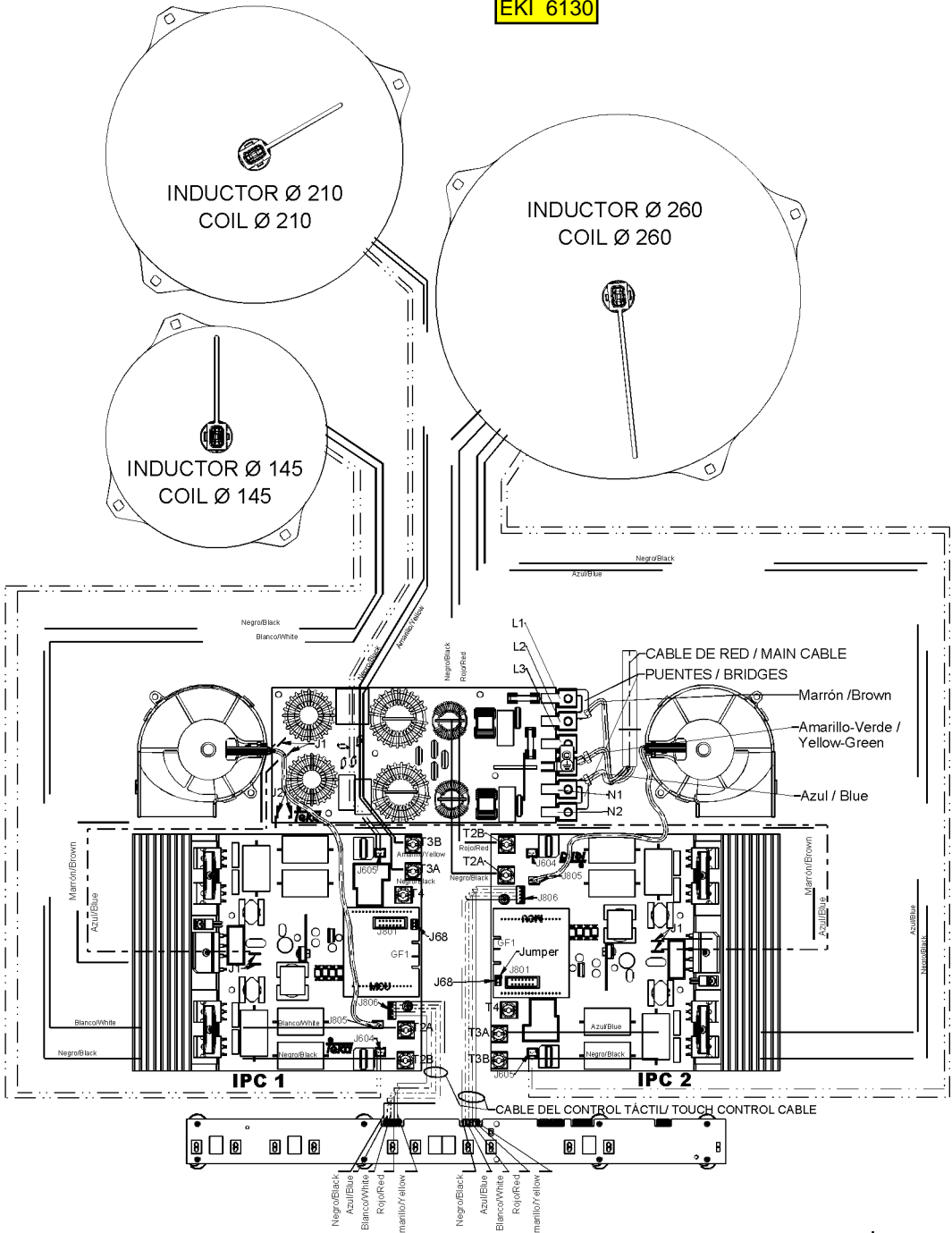


IPC Posición "B"
Dirección 2

Conexión cable
ensayo Run=in

Cable señal
IPC posición "A"

Cable señal
IPC posición "B"



TERMINAL/ TERMINAL	CONEXIÓN / CONNECTION
L1	PUNTELL1-L2 PARA MONOFÁSICA / SHUNT
L2	CONECTOR L1-L2 FOR MONOPHASE MAIN SUPPLY
L3	SIN CONECTOR / NOT CONNECTED
⊕	TIERRA / PE
N1	PUNTE N1-N2 PARA MONOFÁSICA / SHUNT
N2	CONECTOR N1-N2 FOR MONOPHASE MAIN SUPPLY
T2A, T2B/T3A, T3B	CONEXIÓN ALIMENTACIÓN INDUCTOR/POWER INDUCTOR CONNECTOR
T4	IDEM. OPCIONAL / Id. OPTIONAL COMPONENT
J806	CONECTOR TOUCH CONTROL / USER INTERFACE CONNECTOR
J805	CONECTOR VENTILADOR / FAN CONNECTOR
J604, J605	CONECTOR TERMISTOR INDUCTOR / COIL THERMISTOR CONNECTOR
J801	CONECTOR EXTENSIÓN DOMINO / DOMINO EXTENSION CONNECTOR
J68	CONECTOR JUMPER / JUMPER CONNECTOR (Position A= No Jumper, Position B=Jumper)
J1	ENTRADA ALIMENTACIÓN AL CONVERTIDOR / INPUT MAIN CONTACTS-CONVERTER BOARD
J1, J2	SALIDA ALIMENTACIÓN AL CONVERTIDOR / OUTPUT CONVERTER BOARD SUPPLY
GF1	CONECTOR DE SERVICIO."SAM"/ "SAM".SERVICE CONNECTOR

- CABLE ALIMENTACIÓN INDUCTOR / POWER INDUCTOR CABLE
 CABLE TERMISTOR (SONDA TEMPERATURA 6 NTC) / THERMISTOR CABLE (NTC)
 CABLE ALIMENTACIÓN CONVERTIDOR (L) / CONVERTER BOARD SUPPLY CABLE (L)
 CABLE ALIMENTACIÓN CONVERTIDOR (N) / CONVERTER BOARD SUPPLY CABLE (N)
 CABLE DEL CONTROL TÁCTIL/ TOUCH CONTROL CABLE

b	Título: Incluir EKI 6130_0 // Description: Add EKI 6130_0 model		12H	E.S.L.	24.Feb.09
a	Título: Incluir IR 621 / IR 609 / IR 617 // Description: Add IR 621 / IR 609 / IR 617 models		11H	E.S.L.	2.Feb.09
REV	DESCRIPCIÓN DEL CAMBIO / DESCRIPTION OF CHANGE	LOC.	POR / BY	FECHA / DATE	
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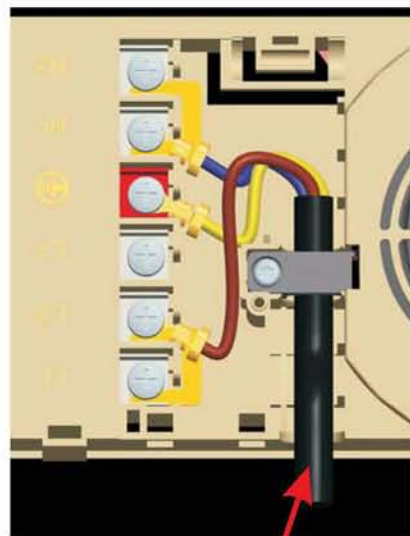
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**VISTA EN POSICIÓN DE
MONTAJE DE LA ENCIMERA**

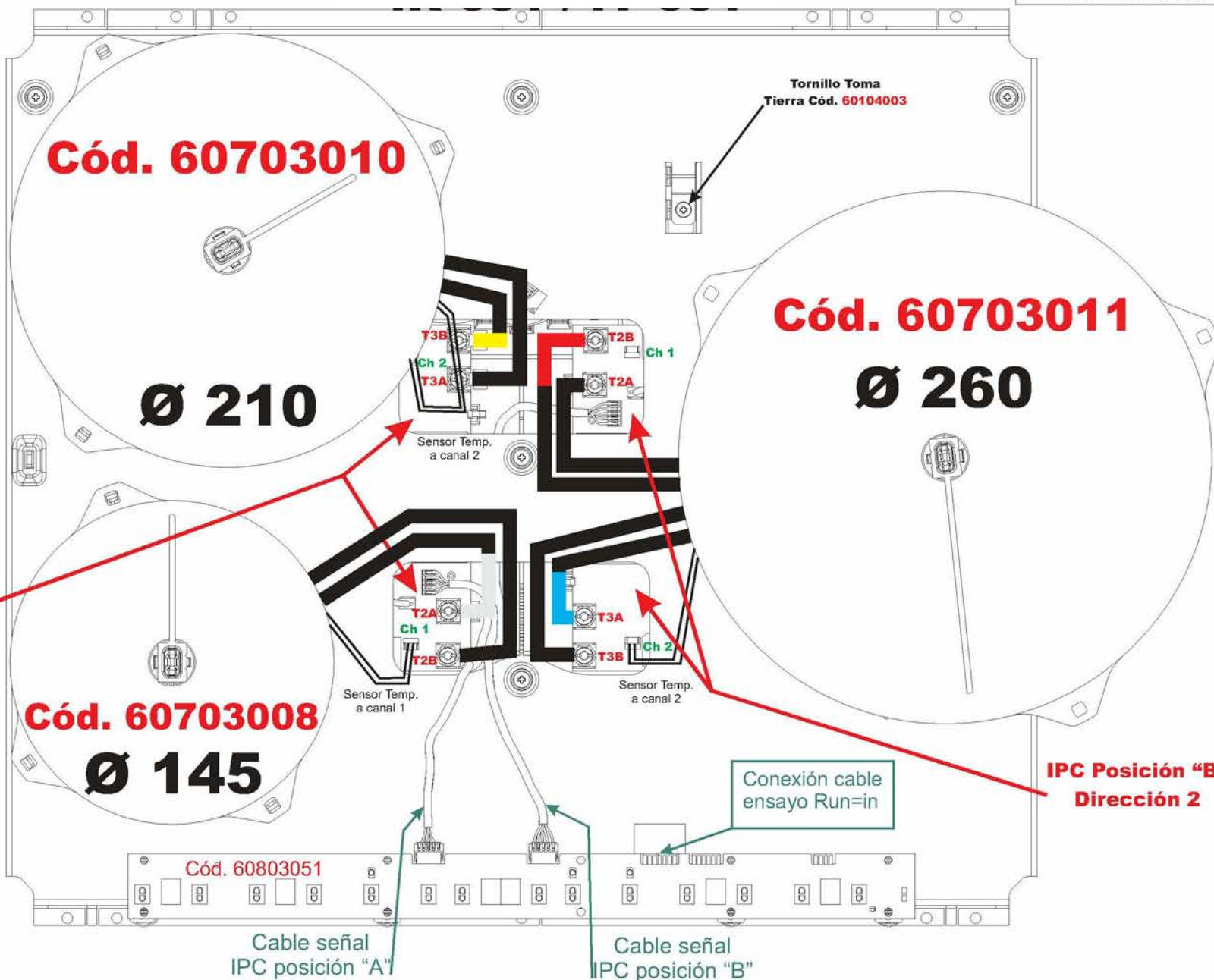
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IPC Posición "A"
Dirección 1



IPC Posición "B"
Dirección 2