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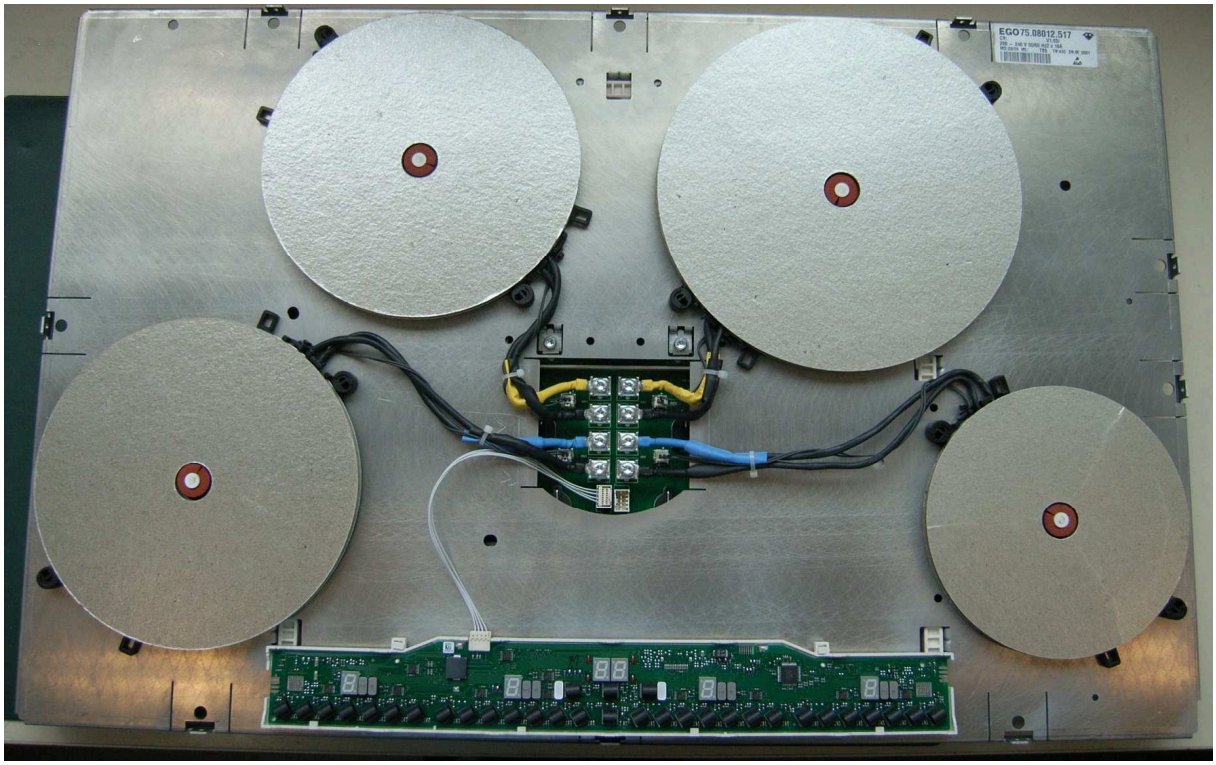
Customer Documentation

Induction Generation 5



(translation of german master document)

Version 14

Change history

Version	Responsible (EKP)	Changed by (EKE)	Date	Change
01	S. Stadtmüller		30th July 09	Preliminary documentation
02	C. Egenter		19th Feb. 10	Testmode with knob control
03	S. Stadtmüller		5th May 10	Power of different pots
04	S. Stadtmüller		1th June 11	Including: – additional converter – Octa – Teppan Yaki – WOK – Flex TC – K6 – third low temp level – fan
05	S. Stadtmüller		29th Aug. 11	General revised version
06	A.Engelhardt		19th April.12	Including: - permanent pot detection (chapter 5.1.11) - TRIC coils (chapter 2.5 / 5.1.12)
07	B.Bechtold		21th May 13	Addition: TC MultiLite (Chapter 1.3)
08	B.Bechtold		15th August 13	Stand by
09	T. Fucik		27th March 14	Grounding
10	B.Bechtold		15th July 14	Change in chapter 1.1.2
11	F. Hübner		9th February 15	Addition in chapter 1 (‚only household‘) New chapter 8.1 (requirements for glass ceramic) Addition in chapter 1.2 (TRIC coil)
12	F. Hübner		23th February 15	Addition in chapter 4.2.1. Option 1 removed Addition in chapter 3.3. Deliver Quantity
13	F. Huebner		01th October 15	General review Addition in chapter 1, 8.2, 5.1.11 Chapter 13.2: new table
14	F. Hübner		30th October 15	Chapter 13.2: update of the table

Subject to change

E.G.O. reserves the right to changes which occur due to technical further development and are compatible as much as possible with the existing design. All customers will be informed in advance via a Product Change Notification. If needed, a sample of the changed components can be requested from E.G.O.

Changes which needs to be informed

- Software changes with obligation approval effects or functional effects
- Component changes (supplier, line, nominal value) with obligation approval effects or functional effects
- New dimension of hardware devices
- Dimensional changes with effect for the application (cable guide, fixations, housing changes….)
- production locations by E.G.O
- Changes of internal processes with effect of the product quality
    - ⇨ Information, sampling after requests, lead time 3 month.

Changes without a need of information
Correction or upgrading the software or hardware without affective approval

- ⇨ Information of E.G.O, responsibility by E.G.O.

Continuous improvement

- Drawing correction
- Changes of internal processes without effects of product quality
    - ⇨ No information, responsibility by E.G.O.

Availibiliy to deliver
To keep our ability to deliver, E.G.O subject to change standard components in a short-term. In that situation the components respectively the component producers will have a higher or equivalent quality. In case of differences, we will get in contact to our customers.

Changes for standard components
The customers will not be informed, when there are changes of suppliers (for example: PCNs for the change of raw material, process, locations), which are not named above.

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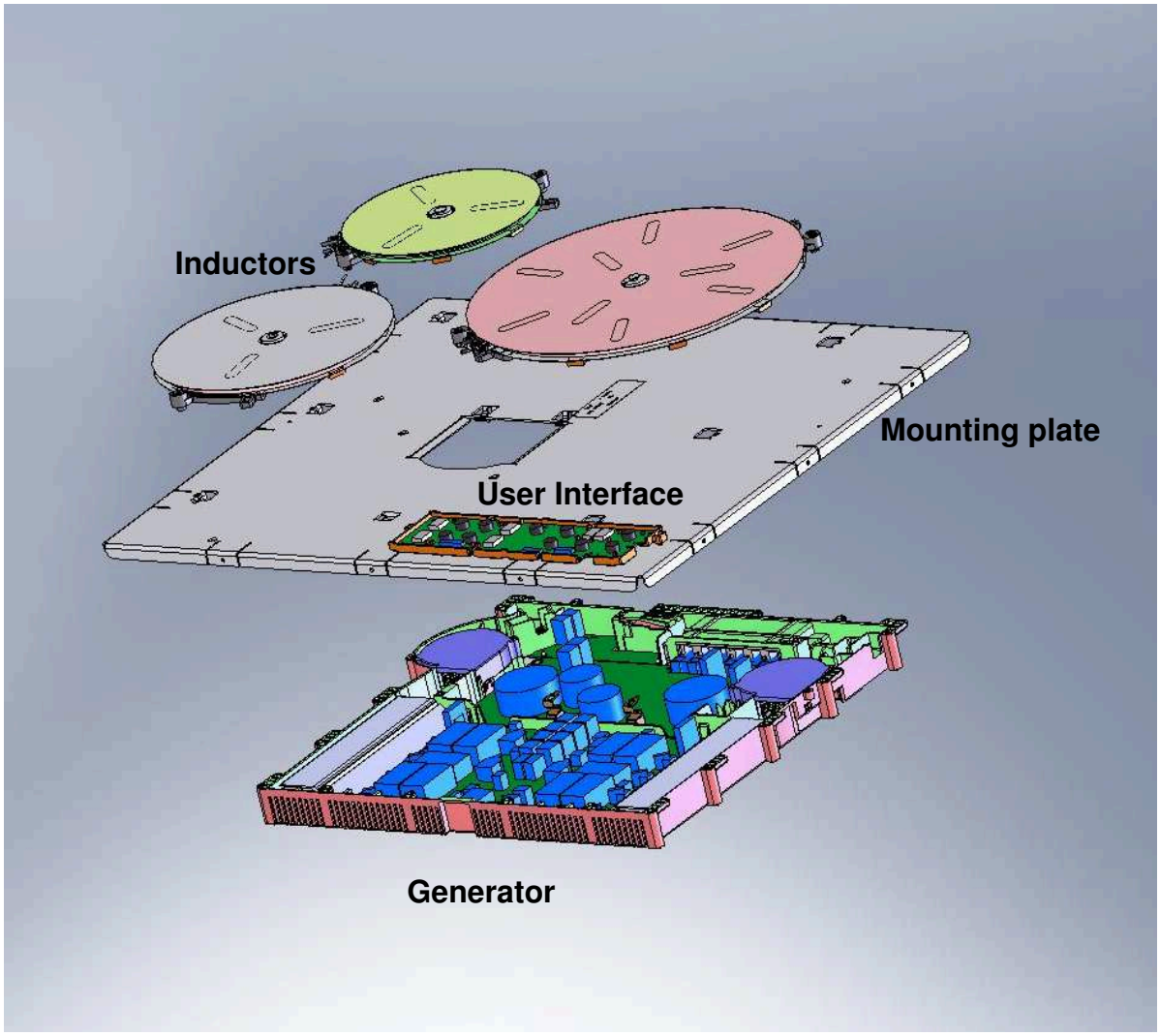
1 System "Induction Generation 5"

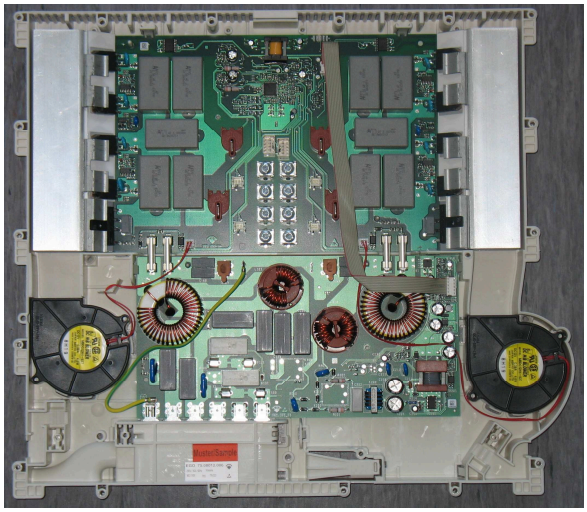
The E.G.O. "Induction Generation 5" is only intended for use in household induction cooktops for distribution throughout Europe. Moreover it is designed for a glass ceramic with thickness of 4 mm. It is not intended for power connection with a Schuko plug. The described features of the “G5 induction” are only guaranteed for intended use.

The "Induction Generation 5" system consists of the following components:

- Generator
- Inductor
- User Interface
- Mounting plate



1.1 Generator(s)



The generator contains up to four frequency converters, a control unit and safety unit, as well as a cooling unit. In addition, it contains the connection for the main supply, relay for separating the converter from the supply voltage, the necessary filters and the small voltage supply of the UI and the bus for communication between user interface and generator.

One inductor per frequency converter can be connected. Two frequency converters are only required for the two-circuit inductors with more than 3.7 kW boost power. The following generators are available with Generation 5:

- 4-burner generator
- 2-burner "Domino" generator
- additional converter

The various generators can be combined with each other up to a maximum connection power of 11,1 kW and a current consumption of 3x16A.

1.1.1 4-burner generator

The 4-burner generator is the basis for the design of cooktops with 3 or 4 cooking elements (the generator is normally ‘less equipped" in a 3-burner cooktop). In combination with an additional converter this generator can be used for a 2-phase (32A) cooktop with 5 cooking zones. In combination with a domino generator this generator can be used for a 3-phase (48A) cooktop with 4, 5 or 6 cooking zones.

The 4-burner generator can be supplied with two or three (‘less equipped") or with four high-frequency converters. It also has an optional switching relay for a connection of an external fan. The housing has the possibility for a stress relief of the mains cable.

The 4-burner generator is available as a “Single” or a “Master” version. The “Master” version contains some additional assembled parts. These assembled parts make it possible to connect an additional 2-burner generator or an additional converter to the 4-burner generator.

1.1.2 2-burner ("Domino") generator

The 2-burner generator is the basis for the design of cooktops with 1, 2 or up to 6 cooking elements (the generator is ‘less equipped" in a 1-burner cooktop). In combination with an additional converter this generator can be used for a 1-phase (13A or 16A) cooktop with 3 cooking zones. In combination with a 4-burner generator the Domino generator can be used for a 3-phase (48A) cooktop with 4, 5 or 6 cooking zones.

The 2-burner generator can be supplied with one (‘less equipped") or two high-frequency converters. It also has an optional switching relay for a connection of an external fan. The housing has the possibility for a stress relief of the mains cable.

The 2-burner generator is available as “Single”, “Master”, “Slave1” and “Slave 2” version. The “Master” version contains compared to the “Single” variant more assembled parts. These additional assembled parts make it possible to connect one (“Slave 1”) or two (“Slave1”+”Slave 2”) additional 2- burner generator or an additional converter with the 2-burner converter.
The „Slave 1“ and the „Slave 2“ variant are needed when a 2-burner generator shall be connected with another generator. The “Slave 1” variant is used by “panoramic / linear” or 5- burner hobs. The “Slave 2” variant is used by 6- burner hobs which are built with three domino generators.

1.1.3 Additional converter

The additional converter is a cost and space optimized addition. It can be used in a combination with a 2-burner or a 4-burner generator. In combination with a 4-burner generator this generator can be used for a 2-phase (32A) cooktop with 5 cooking zones or a 2-phase (32A) cooktop with 4 cooking zones including one dual zone. In combination with a 2-burner generator this generator can be used for a 1-phase (max. 16A) cooktop with 3 cooking zones.
The additional converter can be positioned left and right of the 4-burner generator. For the 4-burner generator it can be chosen on which phase/side the additional converter shall be connected.
For the connection of the additional converter with the 2- burner and accordingly the 4-burner generator a cable harness with L and N as well as a remote cable are needed. Furthermore the “Master” variant of the 2-burner and accordingly the 4-burner generators is necessary.
To use the additional converter a software version 1.16 or higher is required.

1.1.4 Converter, connection of inductors

Three differently dimensioned converters are used for G5, i.e. the converter is adapted to the inductors. Using this, the intermodulation between cooking elements is avoided and at the same time efficiency is optimized.
The differentiation of the convertors is made based on the maximum booster power of the respective convertor (inductor assignment see chapter 2.5):

- 3.7: Converter with maximum 3.7 kW power
- 3.0: Converter with maximum 3.0 kW power
- 2.2: Converter with maximum 2.2 kW power

The respective inductor diameter must be connected to the converter intended for this diameter. Furthermore, the correct polarity of the inductor connection must be considered, to achieve the lowest possible EMC radiation (Electro Magnetic Compatibility). The connection cables are marked with colors for this.
A connection plan is available in Document no. **90.03302.345**.

1.2 Inductor(s)

The inductors contain an inductive coil to heat the cookware placed on it and a temperature sensor, to determine the cooking element temperature, as well as a carrier system for fastening the inductor to a mounting plate. The Induction G5 is designed for a glass ceramic with a rated thickness of 4 mm. The installation height of the inductors is 12+1mm.

The round inductors are available in the following electrical diameters and booster powers:

- 145mm diameter with 2.2kW boost power
- 180mm diameter with 3.0kW boost power
- 210mm diameter with 3.7kW boost power
- 260mm diameter with 3.7kW boost power
- 260mm 2-circuit diameter with 5,5 kW boost power

In addition the following special shapes are available

- 145mm Teppan Yaki with 1.4kW boost power
- 180x280mm "Oval" with 3.7kW boost power
- 184x220mm "OKTA" with 3.7kW boost power
- 270mm WOK with 3.0kW boost power
- 260x138mm "TRIC" with 2,1kW boost power (not approved for Japanese market)

1.3 User Interfaces

The User Interface represents the interface of the cooktop with the user. In the Induction Generation 5 every family of the E.G.O. controls are available with an E.G.O LIN bus interface as control. Details of this:

Touch Controls:

- E.G.O. Touch Control Lite Slider (for 1 to 4 cooking zones)
- E.G.O. Touch Control Flex (for 1 to 6 cooking zones)
- E.G.O. Touch Control Multislider (for 1 to 4 cooking zones)
- E.G.O. Front Touch Control (for 1 to 5 cooking zones)
- E.G.O. Select Touch Control (for 1 to 4 cooking zones)
- E.G.O. Touch Control Lite (for 1 to 4 cooking zones)
- E.G.O. Touch Control MultiLite (for 1 to 5 cooking zones)

Knob Controls:

- Knob Control “K6” for 2 to 6 cooking zones
- Knob Control for 1 to 4 cooking elements with optional LEDs

Note:
The knob controls are not possible in combination with a warming zone. It does not support double-circuits and bridge function of Induction G5.

Communication within the induction system between the UI and the generator is done via a bus system with a special E.G.O. protocol (API). This separation between input functions and the heating function is the basis for the modular design of the entire system. The induction is thus responsible for the power control and temperature monitoring as slave, while in the user interface the customer-specific user philosophy is stored. For erroneous or interrupted communication between the controls and the generator, the generator is shut off.

Code switch

- Code switch for lever control (EU) E.G.O. part number 44.02020.000
- Code switch for level control “K6” (EU) E.G.O part number 44.02020.010
- Code switch for lever control (UL) E.G.O. part number 44.02020.100

1.4 Mounting plate and accessories

1.4.1 Mounting plate

The mounting plate is the connection between the induction system and the customer-specific framework. An additional hob bottom is not necessary for induction G5 in Europe, but can be used for reasons of marketing or standards. This should not constrict the cooling and access to the power connection.
The design-relevant components, such as displays, touch controls and inductors are designed so they can be placed flexibly over the mounting plate.
The generator with the power connection is placed in a plastic box under the mounting plate.

2 Technical data

2.1 Voltage ranges and frequencies

Rated voltage	200V - 240V +10 / -20%
Rated frequency	50/60 Hz
Rated current	16 A per phase

2.2 Under/over voltage protection

2.2.1 Under voltage protection

Under voltage detection	U_{under} < 180V
Hysteresis for restart	typical U_{under} + 10V

2.2.2 Over voltage protection (false connection 400V with 3 phase supplies)

The generator filter has an over voltage protection, which during arbitrary changing of phases and N, prevents the operating of the induction system and an outage connected with it on 400V.

Operating threshold false connection protection	typical 340V AC
Maximum connection voltage	440V AC
Highest duration of maximum voltage	30 min at T_U 40°C

The induction system will not be damaged by exchanging the phases L' and neutral conductor N'.

2.3 Standby consumption of the Induction Generation 5 system

The Standby consumption is defined by switched off induction system (stopped fan, displays dark) and is referenced to the entire system (1 to 6 cooking elements on the cooktop including E.G.O. user interface).

- Stand by according to EC No. 1275/2008 Annex 2

2.4 Power

2.4.1 Nominal power / standard power

nominal voltage (U_r)	230 V +\- 1%
nominal frequency (f_r)	50 Hz

The nominal power is measured with the reference cookware WMF Gala Plus ,or similar style Silit Competence with 1.4520 bottom material, with two liters of boiling water. The reference cookware covers the inductor completely and is centered on the cooking element.
The reference cookware WMF Gala Plus has bottom material 1.4520 and is similar styled as Silit Competence. The inductive characteristics of this reference cookware is representative for a lot of sandwich cookware series with bottom material 1.4016 or 1.4520.
The nominal power of a converter pair or a generator corresponds with the maximum possible connection power (1x16A, 2x16A or 3x16A),

2.4.2 Converter power

The maximum converter power depends on the inductor to be connected:

1-circuit inductors	
Converter power of the 145mm inductor and the Teppan inductors	2.2kW
Converter power of the 180mm inductor and the WOK inductors	3.0kW
Converter power of the 210mm, 260mm and oval inductors and OCTA-inductors	3.7kW
2-circuit inductors	
Converter power of the interior 2-circuit inductor	3.0kW
Converter power of the outer 2-circuit inductor	3.0kW
Converter power of the total 2-circuit inductor	5.5kW

2.4.3 Power tolerance

- Tolerance in nominal operation -10/+5%
- Tolerance of the smallest continual controlled power level -25/+15%
- Power consistency between single and dual operation 14%

Note:
Not each pot is suitable to reach the full boost power due its magnetic and electrical characteristic.

2.5 Power of the inductors, Limit cokware detection

Electrical diameter	Nominal power	Booster power	necessary converter:	Limit cookware detection	
				Cast iron plate is detected	Recommended diameter for manual
145 mm	1,4 kW	2,2 kW	2,2	90 mm	120 mm
145 mm	1,4 kW	1,4 kW	2,2	Teppan Yaki Platte	
180 mm	1,85 kW	3,0 kW	3,0	110 mm	145 mm
210 mm	2,3 kW	3,7 kW	3,7	120 mm	145 mm
260 mm	2,6 kW	3,7 kW	3,7	160 mm	180 mm
180x280 mm "Oval"	2,3 kW	3,7 kW	3,7	150 mm	180 mm
OCTA (single)	2,1 kW	3,7 kW	3,7	90 mm	115 mm
OCTA (single) in bridged mode	1,85 kW	Not possible	3,7	110 mm	135 mm
OCTA (bridged) in bridged mode	3,7 kW	Not possible	3,7/3,7	220 mm	245 mm
270 mm „WOK“	2,3 kW	3,0 kW	3,0	160 mm	180 mm
180/260 mm*	1,85/2,6 kW	3,0/5,5 kW	3,0/3,0	100/240 mm	125/250 mm
180/260 mm*	1,85/3,7 kW	3,0/5,5 kW	3,0/3,0	100/240 mm	125/250 mm
TRIC (single)	1,4 kW	2,1 kW	2,2	100 mm	120 mm
TRIC (2 coils bridged)	2,3 kW	3,7 kW	2,2/2,2	150 mm	180 mm
TRIC (3coils bridged)	2,8 kW	3,7 KW	2,2/2,2/2,2	260 mm	280 mm

* two-circuit inductor with two converters
The cookware detection limits are specified with circular plates make of cast iron GG20 (E.G.O. hotplate casting) measured with nominal power.

If you have a pot with good magnetic characteristic (high magnetic part) then also smaller vessels as the named above can be recognized from the induction electronic. Whereas if you have a pot with bad magnetic set up (slight magnetic part) it is possible that bigger pot diameters, as the named above, are necessary that they will be detected.

Often cookware is detected for operation by the induction electronic even with smaller diameter than mentioned in above list. The standard fork according to EN60335 (2mm thick steel element with 10 x 2 cm) is not heated for sure.

Note:
- E.G.O. suggests using the recommended pot detection values for the cooktop manual as well. The larger diameters, compared to the assured diameter with detected cast iron plate, avoid trouble with end user.

- The pot detection electronic measures the covered area with suitable, ferromagnetic material above the windings. The measured pot detection value as well as the power output is effected by the cookware material and the mechanical structure (e.g. rounded edges of cookware bottom, stampings in bottom, aluminium support rings of some pans, deflection/evenss or non centric position of cookware)
- Small or badly suitable cookware takes less power compared with matched and well suitable cookware. The power outlet of very small cookware is significant fewer due to the progressive power control characteristic.

2.6 Environmental conditions of the electronic components

♦ Operating temperature	0 to 85°C, max. 93% rel. humidity (T < 40°C)
♦ Storage temperature	-25 to 85°C, max. 98% rel. humidity

Before startup of the system it must be ensured that there will be no condensation on the electronics.
An air humidity test of the induction system must be performed at maximum 40°C.

2.7 Temperature monitoring of the cooking elements

2.7.1 Residual heat indication

Switching threshold can be configured for each UI, standard values are:

♦ On threshold heat display	5°K over off threshold
♦ Off threshold heat display	approx. 65°C

2.7.2 Absolute measured values

The glass temperature of a cooking element is monitored for protection of cookware set on it, e.g. avoid the flash point of oil or heating empty cookware. (see chapter: 5.1.2)

When exceeding a first threshold the booster function ends.
When exceeding a second, higher threshold, the power of the cooking element is reduced to 60% of the required level respectively 60% of the nominal power.
When exceeding a third, highest threshold, the cooking element is shut off.
Furthermore all cooking zones are switched off if a maximum value is exceeded in order to ensure safety of appliance.

Values are configured specific to the UI:

♦ Cooking element temperature threshold 1 (booster end)	default: 160°C / max 200°C
♦ Cooking element temperature threshold 2 (max. 60% power)	default: 240°C / max 250°C
♦ Hysteresis:	2K
♦ Cooking element maximum temperature (cooking element OFF)	default: 260°C / max 270°C
♦ Safety switch off of all cooking elements	285°C

2.7.3 Calculation of cookware temperature

A value for the temperature on the upper side of the glass ceramic is calculated besides the measured temperature beneath the glass ceramic. If this value reaches certain limits than first the boost function is stopped. In a next step the standard power may be reduced to 60% of the required level or max 25% of the standard power.

Note:
If the cookware has an indented stamp/ indention in the center of the bottom, the temperature protection is limited.

2.8 Temperature monitoring of the generator (heat sink temperature)

The electronics of the induction system is protected from being destroyed by internal excess temperature. For this the given power is reduced if necessary.
When exceeding a first threshold of the cooling unit temperature, the booster function ends.
When exceeding a second, higher threshold, the power of both cooking elements of the affected converter pair (both are located on the same heat sink) are reduced to 60% of the required level respectively 60% of the nominal power.
When exceeding a fourth, highest threshold, the converters, assigned to the affected cooling unit (converter pair), stop operation. Power drops to 0 and also the pot detection stops in that highest excess mode.

- HS_Temperature threshold 1 (booster end) 80°C
- HS_Temperature threshold 2 (power reduction 60%) 89°C
- HS_Temperature threshold 3 (power reduction 40%) 94°C
- HS_Temperature threshold 4 (converter stop) KK-T3 + 5K
- Hysteresis 1 K

E.G.O. Touch Control does not indicate reduced power due to electronic temperature excess as standard.

2.9 Fan control of the generator

The fan speed is normally determined by the measured electronics temperature on the heat sinks. Both fans of the 4-burner generator start always simultaneous with low speed in order to get a uniform cooling of the total system. If one heat sink temperature reach the threshold than only the speed of the related fan is increased to high level.
In case of very high total power of a converter pair (both elements on 100%, respectively one on booster) the fan is switched on independent of the measured temperature - but the fan just blow if a cookware is really detected and powered, only a high setting on the TC without pot is not considered as very high power.
Also, the fan keeps running (max. 600sec) after the generator cuts off, until the measured temperature drop below the cutoff threshold, however to reduce noise it is limited to the low speed.

Fan threshold temperatures:

- Start low speed 45°C
- Start high speed 55°C
- Hysteresis 4 K

In test mode the fan run automatically at low level.
The fan speed is limited to low speed on main voltage levels <180V in order to avoid overload of the small voltage supply.

2.10 Life time, Warranty

The induction system G5 is, depending from application and using, designed for a life time of 10 years, basing on a life time test which considers 2.500 operating hours per cooking element.
The operating time is divided into 1,000h at full load
500h at 50% load
500h at 30% load
500h at 10% load
The life time test is done with various power levels, in order to be in line with the real use for parboiling, simmering, grilling and warming.

Warranty
36 month beginning with production date of E.G.O.

Attention is invited that Induction G5 is not designed for use in commercially used appliances and such use explicit excluded by mentioned warranty. The use in commercial appliances is always suspected if an operating time of more than 1.500 h date is given within the period of 36 month after E.G.O. production.

2.11 E.G.O. Bus interface LIN Bus

4- pin edge connector	Rast 2.5 mm	PIN 1	GND
		PIN 2	Data 5 V
		PIN 3	5 V DC (+/- 5 %), max. 500 mA
		PIN 4	13.2 V DC (+/- 5 %), max. 250 mA
Available total power on PIN 3 + 4		max. 3.3 W.	

3 Scope of Supply

E.G.O. offers the Induction Generation 5 as an induction system (“heating”) or alternatively as components.

3.1 Induction system ("heating")

A heating of Induction Generation 5 contains all the electronic components necessary for an induction cooktop. The inductors and controls are assembled on the mounting plate and connected to one or more generators fastened under the mounting plate.
For a complete cooktop, only the appropriate glass ceramic and a frame construction are additionally necessary. The frame construction is used for fastening the glass ceramic and induction system.
E.G.O. provides the customer with a selection of standard variants of this system without development, investment or tool costs. In addition, customer-specific solutions can also be developed. Some costs has to be charged in that case.

3.2 Components

The individual components of an induction system of the Induction Generation 5 (with the exception of the mounting plate) can also be separately ordered from E.G.O. With the assembly the customer also assumes responsibility for the system. E.G.O. makes sure that the entire system functions according to specification, independent of the tolerance of the E.G.O. individual components, as long as the assembly and configuration is performed properly by the customer. EGO has mounting and configuration information available to support the customer.
There are E.G.O. drawings with reference materials for clear specification for connection cables between components. For production deliveries, cables must be ordered by the customer directly from a cable manufacturer.
The individual components, as well as possible specific accessory parts of the induction system, must be planned separately by the customer. Exceptions are the first customer sample, which E.G.O. may supply accessories as well for simplified introduction of the technology.

3.3 Logistics

The Induction Generation 5 is provided for delivery in pallet units. Special request for smaller quantities is required. Inductor elements can be dealt as cardboard packets.

4-burner generator	88 pieces per pallet
2-burner generator	88 pieces per pallet
Heating system 60cm	20 pieces per pallet
Heating special size	12 pieces per pallet
Inductor Ø145mm	12 pcs per cardboard/ 720 pieces per pallet
Inductor Teppan Yaki	12 pcs per cardboard/ 480 pieces per pallet
Inductor Ø180mm	12 pcs per cardboard/ 540 pieces per pallet
Inductor Ø210mm	12 pcs per cardboard/ 432 pieces per pallet
Inductor Ø260mm	12 pcs per cardboard/ 432 pieces per pallet
Induktor OCTA	12 pcs per cardboard/ 540 pieces per pallet
Inductor oval 280x180mm	12 pcs per cardboard/ 288 pieces per pallet
2-circuit inductor Ø260mm	12 pcs per cardboard/ 216 pieces per pallet

The delivery of complete pallets is done in original ocean freight pallets (disposable), but an additional Euro pallet (reusable) and a cover (reusable) is placed underneath for standardized transport.

4 Installation concept/ Construction

4.1 System

The Induction Generation 5 system consists of a generator fastened under a mounting plate and inductors and UI which are fixed on the mounting plate.
The electric components of the generator are assembled in a plastic housing. The mounting plate is attached to this housing by sliding or screwing on (the same as Induction G4). The sliding on variant should preferably be used. The generator under the mounting plate can also be positioned off center depending on the heating-model.
The design of the tray must also have height tolerance compensation (ex: by cuts in the mounting plate). This compensation should ensure that the inductors with the temperature sensor lie against the underside of the glass ceramic surface (cooking element). The height dimension between the top edge of the mounting plate and the bottom edge of the glass ceramic plate is specified for the system (inductors) at 12 mm+ 1 mm.

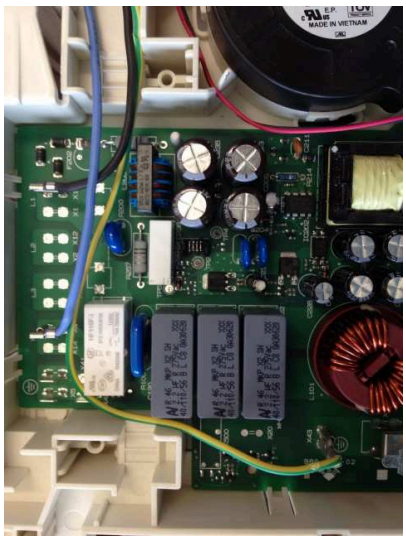
Important note:
Design guidelines must be taken from the installation documentation induction applications G5 **90.03302.366.**

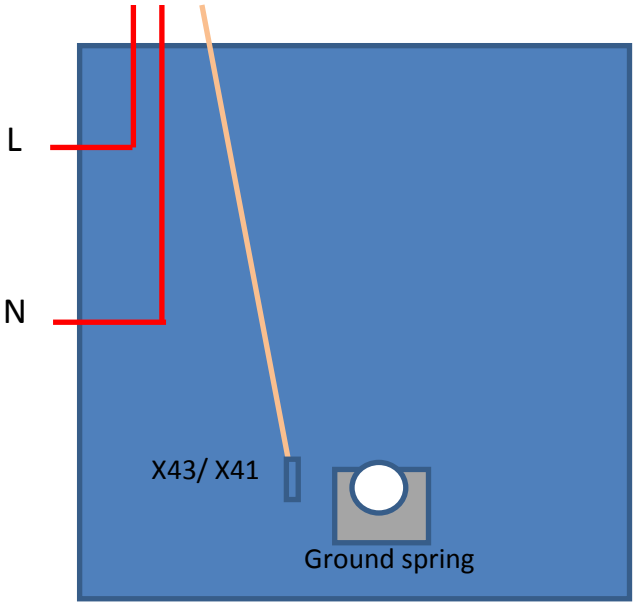
4.2 Wiring

When placing the wiring, basically make sure that there are no kinks, pinching or tension stress in the wires. No wiring must be placed in an area with sharp edges or parts with fins.
The wiring must in no case be placed under or over the UI or pinched. They must be guided directly out of the mounting plate cutout. The remaining cable placement must be done over the mounting plate, because, for example, scattering in the signals can occur due to IGBTs or in the area of the resonant circuit.
Close and parallel wire guides from LIN wires and inductor cables must be avoided. Possibly the wires must be held in the respective specified position by corresponding design measures.
Sometimes sensitive signal wiring has to be drilled or ferrites should be placed in order to avoid couplings.

4.2.1 Grounding

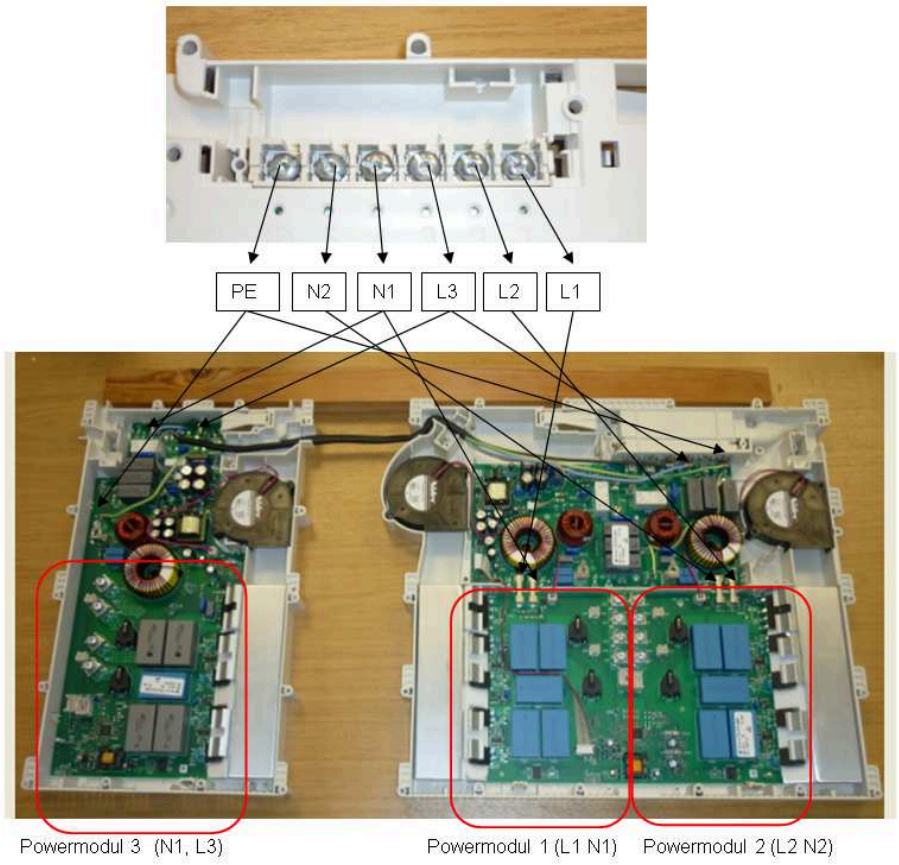
Specialities Domino Generator
In order to asure the safety of the user the generator has to be grounded sufficiently.
Option 1: PE-cable of the net connection on X5/X15. In this case there is an additional connection cable (min. cross section 1,5 mm^2) between X5/X15/X42 and X41/X43 to be connected.
Option 2: The PE cable of the net connector is directly connected to X41/X43. In this case the additional cable between X5/X15 and X41/X43 is obsolete. This version might has slight EMC advantages.





4.2.2 Combination of generators

In case a combination of generators is used it has to be assured that both generators are included in the safety precautions. (see picture below)



4.3 Mounting plate

The mounting plate must have good electrical conductivity and must not be magnetisable. The E.G.O. induction components are designed for mounting plates made of aluminum. The typical sheet thickness for the mounting plate is 1.5 mm. The mounting plate should be beveled on the exterior for stiffness and contains means for height tolerance compensation.
Preferably a semi-hard aluminum material, AlMg3, is used for the mounting plate.

There is a standard cutout on the mounting plate for wiring the inductors. This cutout enables connection of the inductors, the corresponding temperature sensors, and the grounding connection of the mounting plate and the wiring of the UI. To prevent damage to the wires, the mounting plate must be free of fins.

4.4 Inductors

4.4.1 Wiring of the inductors

The wiring of an inductor consists of two power cables and a plug connector for the temperature sensor. The corresponding connections on the circuit board are directly next to each other. The plug connector for the corresponding temperature sensor cable is located between the two clamps for the two power cables of the inductor.
When positioning the inductor wires, make sure that the wires are in never placed or pinched under or over the UI.

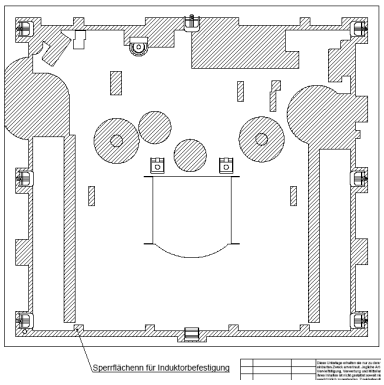
Important note
When connecting the temperature cable of an inductor make sure that the sensor is connected on the same cabling block as the inductor wires. To have a perfect connection from the inductors to the conductor plate the right turning moment has to be used.

4.4.2 Fastening the inductors

Two clips are provided for fastening the carrier system of the inductors. These can be fixed through the corresponding holes in the mounting plate, so that they can no longer fall out.
An exception is the oval inductor and the Octa inductor because of its shape. This only has the fastening clips and can be fastened using clip 969.319. The Octa Inductor has snap arms.

4.4.3 Blocked areas

All inductors can be placed in different positions on the cooktop
The required minimum clearances are defined. (see chapter 4.4.5)



Since the fastening clips of the inductors extend out of the bottom side of the mounting plate, these cannot be placed over certain areas of the generator. For example, certain components of the filter are blocked because they contain air and leakage paths and by the frame of the housing.
Details can be taken from the installation documentation **90.03302.366**.
This drawing shows the blocked areas if the mounting plate is fixed without distance to the generator box. In case of 1.2 mm distance for even mounted screws less area is blocked.
So that the cooktop arrangement must not be changed in such a case, the position of the generator can be shifted or the inductors turned.

Note:
The specified blocked areas are to be respected, although sometimes the real component height is less high due to alternative, second source components.

4.4.4 Covering the cutout in the mounting plate by inductors

The mounting plate shields the electronics against the magnetic field of the inductors. If an inductor is placed partially over the cutout, it must be checked whether an interference of the electronics by EM coupling is possible and if so an additional shielding plate of aluminum (with a thickness of max. 0.5 mm in case of a mounting plate thickness of 1.5mm) must be inserted.

4.4.5 Required distances of the inductor(s) and the user interface(s)

The touch sensors (outer edges -> unobstructed clearance) require 10mm clearance to the adjacent electrically conductive materials; otherwise there is the possibility that the function of the touch sensors can be negatively affected.
The UI (outer contour of the circuit board) require a clearance of 20mm to the outer contour of the inductor fixture, to avoid a possible interference on the Touch Control.
No mutual impact happens if distances between (round) inductors are more than 15 mm. If two round inductors are placed close to each other, the pot detection sensitivity is reduced by an equivalent of 10mm diameter. So in dual operation the pot detection works a little bit more restrictive in this arrangement.
A clearance of 10mm from the inductor (outer edge of the mica disk) to the frame or other electrically conductive materials should be held. If this distance is not reached, check warming of the frame and the EMC. The result is influenced strongly by the material of the frame.
Details for design regulations and recommendations are summarized in the documentation "Installation of components" **90.03302.366**.

4.5 User Interfaces / Touch Controls

4.5.1 Fastening

The UI are preferably mounted in a plastic housing with springs for tolerance compensation. At least two locating tabs must be provided on the TC housing, which enables positioning on the mounting plate. As with the inductors, with the UI the blocked areas must also be considered.
During positioning of the controls using clip 969.319 on the mounting plate also make sure at this point that there are no open holes in the mounting plate. This can interrupt the proper function of the touch sensors.

4.5.2 Configuration of the induction

During the configuration of a cooktop, the UI download the settings to the generator as the arrangement, the size and power of the connected cooking elements. Configuration must be done individually for each cooktop; however it runs completely automatic after the first connection to power, if the generator was still not configured. (See sequence diagram in appendix chapter 16)

During manual configuration a maximum of 10 different configurations can be selected for each UI on which cooking element arrangement should be configured. This way variance in spare parts or with smaller piece counts can be avoided.

An induction heating Generation 5 is already configured when delivered and can immediately be put into operation. The inductors are connected to the respective provided converter and the necessary power features are already assigned by the controls.

4.6 Connection of conventional radiation heaters, warming zones and external fans

A mixed induction with radiant heaters is not provided with Induction G5.
A conventional warmer zone (max. 120 W) can be optionally connected to a relay in the generator. This can be turned on and off via the UI as an additional zone.
Alternatively, an external, inherently safe fan can be switched on this auxiliary relay.
The auxiliary relay is possible as optional auxiliary equipment by both the 4 burner generator and also for the Domino. Max. 2 auxiliary relays are supported by a G5 system.

5 Description of Function

5.1 Functions of the generator

5.1.1 Integrated cookware detection

The pot detection function is active after the activation of a cooking element (cooking level > “0”) and requires approx. 2.5s to check if cookware is present. Display on UI, see chapter 5.2.2.

E.G.O. recommends using the recommended pot detection values (see chapter 2.5) for the cooktop manual as well. The larger diameters, compared to the assured diameter with detected cast iron plate, avoid trouble with end user.
The pot detection electronic measures the area above the windings which are covered with suitable, ferromagnetic material. The measured pot detection value as well as the power output is effected by the cookware material and the mechanical structure (e.g. rounded edges of cookware bottom, stampings in bottom, aluminum support rings of some pans, deflection/evenness or non-centric position of cookware).

5.1.2 Excess temperature protection of the generator, cooking element

All components of the induction are protected from damage of excess temperatures. For this there are corresponding temperature sensors provided in the electronics.
If maximum temperatures on heat sinks or on inductors (bottom side of glass) are exceeded, the power of the system is first reduced or the system is completely shut off. The limit values are specified in chapter 2.7and 2.8.
An additional protection for empty boiling cookware is included in order to reduce power output before the absolute measured limits are reached. A value for the temperature on the upper side of the glass ceramic is calculated through a mathematic model each 4 seconds.

5.1.3 Integrated cooling

The cooling is integrated in the generator. The operation of the fan is controlled by the temperature set on the cooling element. The fan turns itself on if a first temperature threshold is exceeded. The fan switches to high speed if a second temperature threshold is exceeded.
The rotation speed is monitored. If no air can be intaken (e.g paper beneath the inlets) or the rotator is blocked than an error for the affected converter pair is detected and may be displayed

5.1.4 Selection of standard power

Preferably the standard power of several cooking elements is selected, so that their sum is smaller or equal to the maximum permissible power of a converter pair, so that engagement of power management (with/without virtual power) is only necessary for boost.

5.1.5 Powermanagement

In the Induction Generation 5 the power is limited, when the zones are bridged. Since some inductors alone already can accept a booster power, it is possible that cooking elements connected together require more power than can be made contemporaneously available.

Powermanagement is used to avoid an overload of a phase. For this the required total power is permanently monitored, and reduced if necessary. If the required total power cannot be supplied, an E.G.O. control element by default reduces another cooking element to the next smaller regular level of its power curve, so that the 16A current consumption is not exceeded. Here the generator observes the last send UI command with highest priority and reduces, if necessary, the previously activated settings to another cooking element. Powermanagement first engages, in contrast to Induction Generation 4, also if cookware is detected on the cooking element.

By expansion of the G5 base unit using an additive converter, more than 2 cooking elements can also be under a common powermanagement.

Default power management
The function “power management” is installed by default in every system and it monitors the maximum permissible power output of 3.7 kW/16 A for combined cooking elements.

As soon as higher output is requested by the user, this is transmitted back to the UI via the bus and the power level to be reduced by the power management blinks on the UI. The user can then cancel the request within 3 seconds or the system reduces the other cooking element(s) to the maximum cooking level still possible.

“Virtual power “output – Supplement to power management (optional)
The “virtual power” output function can supplement the standard power management and give the user virtually the availability of 13.5% more output than could actually be taken from the power supply. So the power supply and device remains protected from over current, but the user profits from additional setting options with simultaneous use of several cooking elements. Thanks to the limit at max. 13.5% (3.7 kW x 1.135 = 4.2 kW), the effect stays in a range in which hardly a change of the cooking behavior is noticed by the user.
The slight reduction by the power management “virtual power” is not displayed to the user by the controls.

For power requirements less than 3.7 kW there is no effect from this function, i.e. the requirements of UI are converted 1:1.

Example:
Requested rated power with the combination of a 210mm and a 180mm coil
210mm inductor = 2.3kW
180mm inductor = 1.85kW
total requested power = 4.15kW

⇨ Slight reduction by 11% necessary on both cooking elements (4.15 x 0.89 = 3.7 kW)

⇨ Actual output of the coils in this setting:
210mm inductor = 2.05kW
180mm inductor = 1.65kW
real total power = 3.7kW

Powermanagement with more than two cooking elements
If more than two cooking elements are connected together (e.g using the additive converter), the power management first reduces the power of the other cooking element with the lowest priority or if necessary shuts it completely off. If shutting off this cooking element is still not sufficient to maintain maximum power, then the cooking element with the next priority is also reduced to the then maximum possible cooking level. Prioritizing the cooking elements, with which the sequence of power reduction in the overload case is established, can proceed individually for the type of cooktop and is assigned via the configuration of the individual cooking elements.

Example: Power reduction in the overload case for three cooking elements

1. Power of the cooking element with the highest priority is increased
   - first the power of the cooking element with the lowest priority is reduced
   - if this is not sufficient the cooking element with average priority is also reduced as much as necessary

2. The cooking elements with average priority are changed last
   - first the power of the cooking element with the lowest priority is reduced
   - if this is not enough the cooking element with highest priority is also reduced as much as necessary

3. The cooking element with the lowest priority is changed last
   - first the power of the cooking element with average priority is reduced
   - if this is not enough the cooking element with highest priority is also reduced as much as necessary

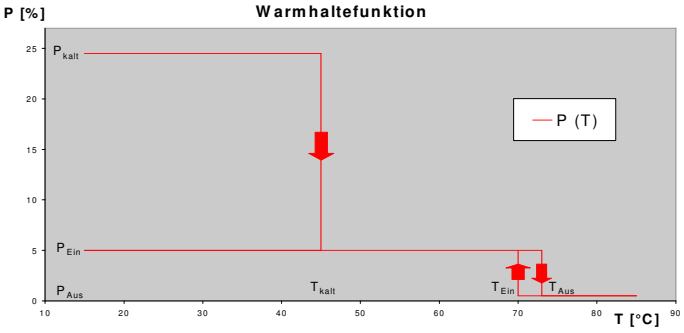
Note:

- Operation of the user is accepted in every case.
- For slight exceedance of maximum power, virtual power can be used if this option is activated.
- The additional converter is always assigned with the lowest priority (exception: last operation)

5.1.6 Residual heat indication

The residual heat of the glass ceramic is measured by a temperature sensor on the inductor, evaluated by the generator and transferred via the bus to the UI.
The G5 can evaluate a maximum of 4 levels (cold – warm – hot – very hot). The threshold values are kept configurable for each UI.

5.1.7 Low temp function



The low temp function is a temperature control function which enables the cookware temperature to be T-loop controlled, i.e. the power required for this is automatically optimized. The accuracy of the regulation is depending upon the evenness of the cookware and the required power.

The target values of the warm-hold function can be configured for each UI.

- Normally with the warm-hold function the power of a cooking element to keep warm is regulated so that the cookware is brought to around 70°C and then maintained there.
- In an optional second level, a second temperature step, for example 45°C for melting, can be additionally regulated.
- In an optional third level it is possible to regulate the temperature to the level of 94°C to simmer.

The function can be used for the following cooking steps:

- keeping food warm
- defrosting or regenerating food
- melting food (e.g. chocolate)
- simmering the food

5.1.8 Boost function

All inductive cooking elements G5 support the boost function. If this function is activated, the maximum boost-power is given from the cooking element, which allows very fast heat up times.
It is recommended to use this function especially for water boiling according to the very high power.
The temperature limit values for the electronic and inductor are reduced in case of boost mode. (see chapter 2.7and 2.8).
The time limitation (default 10min) has to be done by the UI.

Note:
Not each pot is suitable to reach the full boost power due its magnetic and electrical characteristic.

5.1.9 Permanent pot detection

The permanent pot detection allows end customers an intuitive usage of induction cooktops. The function which can be activated in the touch control recognizes active cooking zones in the system. The touch control illuminates only active cooking zones - cooking zones which are not in use will not be illuminated. Changes on the cooking appliances, e.g. placing a new pot on the system will be recognized automatically via a steady controlling of the pot detection signals and will be monitored in the user interface.
Prior condition for the function is at least software V1.20 on induction side and a special type of touch control.

5.1.10 Specifics of two-circuit inductor cooking elements

Each zone of a 2-circuit inductor must be connected to one of the two converter pairs (1x left / 1x right) of a 4 burner generator, so that both circuits can be supplied from different (internal) phases, but both converters controlled from a common micro controller.
A 2-circuit inductor is managed on the induction generator as 2 separate cooking zones.

Operation on UI
The 2-circuit is provided with automatic cookware size detection, i.e. the outer circuit automatically checks if it is covered with a suitable sized cookware. If the permissible coverage is detected, the outer zone automatically switches on when the cooking element is turned on and a signal of the active outer ring on the UI is possible.
Details on standard E.G.O. operation see 5.2

Cookware (size) detection

- The cookware detection of the inner circuit is the same as for 1-circuit inductors.
- Cookware detection of the outer circuit is first done when cookware is detected on the inner circuit.
- The outer circuit is only turned on if sufficient coverage of the outer ring is detected. The switching check is only done during start or restart of the cooking element (i.e. when lifting and returning the cookware). The outer zone is turned off as soon as the minimum coverage is not reached (e.g., not centering the cookware). To avoid a significant power shift by small movement of the cookware, an outer circuit which is turned off is only turned back on after a restart of the cooking element. (Turn the cooking element off and back on or lift the cookware, so that the inner circuit is also not covered).
- In power management with three cooking zones, the 2-circuit cooking element always has the highest priority. For details see chapter 5.1.5.

Power
The Induction Generation 5 is offering two different possibilities to distribute the power between the circuits:
1. Steady power distribution between inner and outer circuit

- only exception is the boost function; here the power of the outer circuit is limited to 3kW
- for the power data please see chapter 2.5

2. Different power distribution between inner and outer circuit for a better heat distribution

- in this version there is a different power data between single and dual use
  - if only the inner circuit is activated the power data is like a 180mm inductor
  - if both circuits are activated the power of the inner circuit is reduced but the outer circuit has in return a higher power.
- for the power data please see chapter 2.5

5.1.11 Specifics of OCTA-Inductor cooking zones

The OCTA-inductors were optimized to make it possible to build a 60 cm hob with four OCTA-inductors a maximal big cooking area and that should be realized in a cost-efficient way. Two OCTA- inductors can be interconnected (dual mode) and they can be handled with one control unit (bridge function).

Fixation
Because of the special shape the fixation concept of the round inductors could not be used for the OCTA inductors. By the OCTA-inductors the fixation concept fixing the inductor on the aluminum plate is a combination of adhesive pads and snap arm.

Bridge mode
It is possible to bridge the OCTA-inductors. So a big cooking area can be generated. But the bridge mode is only possible in horizontal direction (long side of the Octa inductors). The activation or deactivation of the bridge mode is controlled with the operating unit. In the bridge mode it is not possible to activate the boost function.
In the bridge mode the setting of the master cooking zone is assigned to the slave cooking zone. If the power on the slave cooking zone is changed it will not be assigned on the master cooking zone (for example: power reduction because of high temperatures or power management). In that case both cooking zones have different powers. It is important to design the serigraphy in a way that both temperature sensors are covered. Depending on the pot position the power can differ particularly when pots with not suited material are used. The bridge mode has special requirements for the glass ceramic. (see chapter 8.2)

Handling on UI
Each OCTA cooking zone is handled like a cooking zone with round inductors. During bridge mode the two OCTA-inductors can be controlled with one operation. The connection must be done manually (separate button or combination of buttons)
For details of the E.G.O. standard handling see 5.2.

Pot detection
The pot detection in single or bridge mode is done like all other inductors (data see 2.5). In the bridge mode the pot detection is not so sensitive; to be sure that the temperature sensors are covered by the cookware. If the pot is detected on a zone than the whole inductor is active. That means that other magnetisable objects which are placed on the cooking zone (for example a fork) are also heated up. Since the OCTA- inductor is very often not covered completely this situation is coming up more often by OCTA-inductors than by round inductors (in particular small ones). Furthermore this means that several small pots which are normally not working can be detected as one big pot when they are used together on one inductor and so the inductor can be activated.

Connection on generator
The OCTA-inductors need like the other 1-circuit inductors one converter connection on the generator. When two OCTA-inductors shall be bridged, it is recommended to connect the both connectors on the same phase.

Performance
In comparison with round inductors the OCTA-inductors have a higher idle power (particularly when small pots with not well suited material are used). The idle power leads to the fact that the electronics is heating up faster. The consequence of that is that the power is reduced earlier to protect against overheating.

5.1.12 Specifics of TRIC-Inductor cooking zones

The TRIC-inductors were especially developed for further possibilities due to area cooking. A special coil shape allows a mounting of up to three TRIC coils on top of each other. Via a flexible bridging of these 3 zones we can create further flexibility of the complete cooking area. Like other bridge functions is it controlled by the user interface.

Fixation
Because of the special shape the fixation concept of the round inductors could not be used for the TRIC inductors. By the TRIC-inductors the fixation concept fixing the inductor on the aluminum plate is a combination of adhesive pads and snap arm.

Bridge mode
It is possible to bridge up to three TRIC-inductors. So a big cooking area can be generated. The activation or deactivation of the bridge mode is controlled with the operating unit.
In the bridge mode the setting of the master cooking zone is assigned to the slave cooking zone. If the power on the slave cooking zone is changed it will not be assigned on the master cooking zone (for example: power reduction because of high temperatures or power management). In that case both cooking zones have different powers. Depending on the pot position the power can differ particularly when pots with not suited material are used.

Handling on UI
Each TRIC cooking zone is handled like a cooking zone with round inductors. During bridge mode the up to three TRIC-inductors can be controlled with one operation. The connection must be done manually (separate button or combination of buttons)
Details on standard E.G.O. operation see 5.2

Pot detection
The pot detection in single or bridge mode is done like all other inductors (data see 2.5). If the pot is detected on a zone than the whole inductor is active. That means that other magnetisable objects which are placed on the cooking zone (for example a fork) are also heated up. Since the TRIC- inductor is very often not covered completely this situation is coming up more often by TRIC-inductors than by round inductors (in particular small ones). Furthermore this means that several small pots which are normally not working can be detected as one big pot when they are used together on one inductor and so the inductor can be activated.

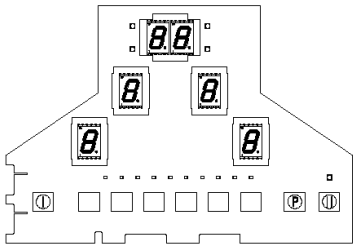
Connection on generator
The TRIC-inductors need like the other 1-circuit inductors one converter connection on the generator. When TRIC-inductors shall be bridged, it is recommended to connect the both connectors on the same phase.

Performance
In comparison with round inductors the TRIC-inductors have a higher idle power (particularly when small pots with not well suited material are used). The idle power leads to the fact that the electronics is heating up faster. The consequence of that is that the power is reduced earlier to protect against overheating.

5.2 Functions of the controls on an example of the E.G.O. TC Lite Slider

The basic functions of the E.G.O. controls based on the Touch Control Lite Sliders are described in the following. A detailed description of the respective UI can also be found in the corresponding functional description of the control unit.
Other User Interfaces can behave somewhat differently in detail, depending on a deviating control philosophy.

5.2.1 Functionality of the Touch Control Lite Slider



The sensors of the slider fields of the Lite Sliders enable both setting of the heating levels (0, u, 1-9, P) and also setting of the timer value (1-99) by touching and moving the finger over the corresponding surface. Moving the finger to the right causes an increase, while moving to the left a decrease of the corresponding value. At any time a direct selection of the desired cooking level is also possible.
If the TC is in the **ON** state after switching on with main switch 0/I, the corresponding cooking element can be selected by directly touching a cooking element display (DIGI select sensors). Finally, by activating the slider field a cooking level is set.
The power of the cooking elements can be set in 9 steps and is displayed by the numbers “1” to “9” on LED 7 segment displays. More standard settings are warm hold function “u” and booster “P”.

5.2.2 Pot detection

If cookware is detected, the “suspended pot” is shown on the cooking element display (standard).

5.2.3 Boost function

The boost function (see also chapter 4.1.8) can be activated after the selection of the appropriate cooking element using the boost function key.
This boost function can only then be activated if it is allowed by the generator (special temperature limitation in the induction for boost mode). If the boost of the desired cooking element is permissible, a “P” appears in the display.
The operation time limitation is also done by the UI.

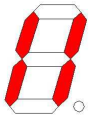
5.2.4 Residual heat display

After turning off the power levels, the residual heat on a cooking element is displayed as long as the temperature is over 65°C (default value).
For implementation in the generator, see also chapter 4.1.6

5.2.5 Heat up time automatic (selectable)

When heat up time automatic is activated, the power of the cooking element is switched to 100% (= standard power) for a time dependent on the selected (simmering) cooking level. After the predefined heat up time is finished, the selected cooking level is switched back to this level.

5.2.6 E.G.O. Pause and Recall (optional function on multifunction keys)



By activating the arranged special button for >1s, the power requirements of the inductors are set to 0%. When the pause button is activated again and then an arbitrary second button, then all settings from before the pause are returned to (= Recall).
The pause condition can last a maximum of 10 min. If the status is not removed within this time, the controls turn off.
Using the Recall function, after accidentally switching off the TC using the main switch, the settings can be quickly returned to. After switching off using the main switch, the user has 6 sec. time to turn the controls back on and another 6s to activate the Pause button. The Pause mode is therefore not possible in the first 6 seconds after switching on.

5.2.7 Limitation of operating time

The limit of the operating time is a function of the UI, i.e. the UI has to switch off the generator.
Depending on the cooking level set, each cooking element is individually switched off after the specified maximum operating time, if within this time there is no operation of the arranged cooking elements.
Each change of cooking element setting with the assigned buttons (setting/changing the cooking level for the corresponding cooking element) sets the maximum operating time of this cooking element back to the start value of the operating time limit.

5.2.8 Key Lock, spillover protection (optional: needs separate key on UI)

Alternative designation of the function: Wiping protection or spillover protection function

Activating the Key Lock button locks the keys and the assigned Key Lock LED is continually lit. The controls continue to work in the previously set mode, but only the Key Lock button itself and the On/Off button can still be activated. All other buttons are no longer monitored so that these are protected against accidental activation when wiping or by spilled over liquids.
Reactivating the Key Lock button (the control must be turned on for this) or a power reset ends the Key Lock function.

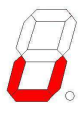
5.2.9 Child Lock (optional)

After turning on the TC, all cooking elements must be OFF (level “0”), the child safety can be activated by a button combination (Digi-select of the front right cooking element and the special function button, far right side). All displays show a “L" for LOCKED (= child safety against accidental turning ON). The electronics remain in the locked condition until unlocking, even if the controls are turned on and off in the meantime.

5.2.10 Timer function

The timer function is implemented in two versions: Standalone timer and cooking element timer
The standalone timer is available even when no cooking element is switched on (all cooking elements on level 0). If cooking begins (level > “0”) when the stand alone timer is active, the stand alone time continues to run.
The cooking element timer is available as soon as a cooking element is active. Up to four cooking elements can be freely programmed for turning off.

5.2.11 Low temp function (optional)



The warm-hold function is a temperature loop controlled function of the generator, which enables the target temperature of the cooking element with optimized power supply.
For this the selected cooking element is operated with a lower power. If the keeping warm function is activated for a cooking element, the corresponding display shows a “u”.

5.2.12 2-circuit element operation (E.G.O. standard)

The outer circuit of the 2-circuit inductor is automatically turned on or again off from the generator depending on the coverage with a suitable, large cookware at the start of a cooking element. See 4.1.9

Activation

- The user switches on the 2-circuit element via the user interface and the inner circuit starts.
- If suitable cookware is detected on the inner circuit, then the outer circuit is also checked and depending on the detection of the size of the cookware, is automatically switched on.

Display

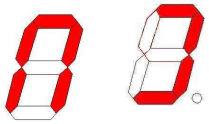
- Inner circuit (“No cookware” symbol or cooking level) is displayed on the 7-segment display.
- Turned on outer circuit can be displayed on optional LED

5.2.13 Bridge function (optional)

With the bridge function two separate cooking elements /inductors with the **same diameter** and **equal power** can be turned on at the same time and controlled with only one operation.

- The total of the standard outputs, that is level “9" for TC Lite Slider, must be possible together (≤3.7 kW, or 4.2 kW at virtual power).
- If bridge function is activated than boost mode is not possible.
- Both zones of the bridge must be arranged next to each other on the UI.

Both connected inductors work in the generator completely independent of each other, they only maintain the same power level values from the UI. That means that the power control, cookware detection or temperature monitoring of both zones work in the generator independently of each other.



Activation or deactivation of the function is done when both cooking elements are selected simultaneously. In the cooking element display of the **patched zone** (rear or right cooking element) there is displayed an upside-down “U” or a backwards “C”. (Symbol may be selected optionally for each UI)

The setting of the cooking level of the bridge is done basically via the plus/minus buttons of the **Masterzone** of the bridge (front or left cooking element), on whose cooking element display the set cooking level is displayed.

Cookware detection is done independently of each other on the two separate zones and displayed on the controls. If no cookware is detected on the core zone, a U is displayed. If no cookware is detected on the patched zone, then U is shown, alternating with U. If cookware is only detected on the patched zone (but not on the core zone), then U is displayed alternating with the cooking level 9 on the display of the patched zone.

To meet the requirements of the safety standard, an uncovered zone with cookware detection must be shut off after 10 minutes at the latest without detected cookware. If in 10 uninterrupted minutes no cookware is detected on one of the two elements, the bridge function is automatically deactivated, the uncovered cooking element is switched off and the covered cooking element remains as the single cooking element switched on with the set cooking level. If, up to the point in time at which one of the two zones are already 10 minutes in operation without detected cookware, also on the other cooking element no cookware is detected, then the cooking element is switched off and the bridge function is deactivated.

The end of the bridge function (deactivation) can be done by repeating the simultaneous selection of both cooking elements (the same as activation). Deactivation is also done by shutting off the TC control using the main switch or by the automatic shutoff of the UI. This means that the bridge function remains activated for briefly switching off the cooking element (= level “0”), it however, deactivates when shutting off the cooking element control.

In the special case that one zone is 10 minutes without cookware and the other zone is cooking, the bridge function also deactivates automatically, but the cooking process is continued on the active cooking element.

If the bridge function is deactivated while in operation, than both cooking elements go to level “0“ and can then be set again.

When activating/deactivating the bridge function, possibly existing settings (cooking level, booster, timer) are deleted and set to “0“. A timer can only be assigned to the Masterzone of the bridge, thus not the patched zone.

If a warm-hold level is activated, the temperatures of both bridged zones are controlled individually.

5.3 Error messages during use

Error messages should inform the user of effects of the electronic monitoring. The following errors are typically temporary and can usually be corrected by the user:

- Missing or unsuitable cookware on the cooking element
- Empty cooking cookware or overheating of a cooking element
- Excess temperature of the electronic
- Requested overload (by UI) and intervention of power management

In addition, error codes from the generator are reported in case of a detected error on the controls. As long as the function of other cooking elements and the safety by an occurring error do not cause negative effects, the non-effected cooking elements can continue to be used. The standard E.G.O. error codes are listed in Chapter 9.

5.4 Test mode

The test mode is used to minimize the test times for the functionality tests of the cooktop.

- the power of the cooking elements is regulated significantly faster. Pay attention! For low power levels <50% the tolerance of the power regulation increases in test mode.
- The fan run continually on low speed in test mode
- The test mode is time limited to max 2 minutes after reset (e.g. connection to main supply) by the generator.

This mode is supported by all G5 compatible E.G.O. User Interfaces as standard.

Activation and canceling of test mode by UI
The test mode may be activated within 10s after a reset (e.g. connection to power supply). If the cooktop is switched on (main switch of UI) within this short period after reset, the induction generator goes to the test mode.
The test mode ends 10 seconds after switching off all cooking zones. If the test mode was active and a cooking zone has been switched off for just 5 seconds, than the test mode keeps active – but not longer than the 2 minutes after last reset of the generator.
A further reset is necessary before test mode may be reactivated again.

6 Covered standards

6.1 Safety standard

EN 60335-1	Household and similar electrical appliances - Safety - Part 1: General requirements (IEC 60335-1:2001, modified)
EN 60335-2-6	Household and similar electrical appliances - Safety - Part 2-6: Particular requirements for stationary cooking ranges, hobs, ovens and similar
EN 60730	Automatic electrical controls for household and similar use

6.2 EMC - standards

EN 61000-4-2...6/11/13 Electromagnetic compatibility (EMC)-immunity test

EN 55014-1	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus
EN 62233	Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure

6.3 Environmental simulation/ Service ability

EN 50304/ 60350	Electric cooking ranges, hobs, ovens and grills for household use - Methods for measuring performance
EN 60068-2-2/14/78	Environmental testing
EN 22248/ ISO 2248	Packaging; complete, filled transport packages; vertical impact test by dropping
ASTM D 4728	Standard test method for random vibration testing of shipping containers

6.4 Environment

EN 16000-9	Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method
RoHS	

6.5 Increased EMC robustness

With burst an increased requirement of 4kV criterion B is met. (Standard EN 6100-4-4: 1kV)
With surge (symmetrical) the requirement of 2kV criterion B is met. (Surge standard EN61000-4-5)
With surge (asymmetrical) the increased requirement of 2.5kV criterion B is met.

7 Test requirements

A sufficient grounding and insulation according to EN 60335 or EN 50106 must be ensured by the final appliance manufacturer.
Ground wire test and high voltage tests are mandatory.

The high voltage test should preferably be performed with 1,500 VDC. Alternatively 1,000 VAC is also possible, but the insulation current must be increased for the Y capacitor in the filter, deviating from EN 50106.

$I_{Y\text{-capacitor}} = 2\pi * 50Hz * C_{Y,ges}\ [+20\%] * U_{HiVoltage,AC}$

The high voltage must be increased in a ramp or at least in steps, to avoid a preliminary damage of the IGBT gates. In any case the high voltage must not be increased in jumps. The use of an electronically controlled high voltage test device with ramp function is absolutely recommended.

Furthermore suitable functional tests on the final appliance are practical:

- Correct function of each sensor button
- Good visibility of all displays
- Power of each cooking element, e.g. on level "9"

Important information for component customers
The correct connection of the inductor T sensor on the generator must be ensured so that the temperature protection of the cooking element functions correctly.

8 Recommended information

8.1 Operating manual

- The cooktop can also get hot during inductive cooking although the cooking surface itself is not heated, since the cookware that is set on it and heated causes the cooking surface to be heated.
- The Induction Generation 5 meets the requirements of the valid EMC standards as well as the EMF guidelines and should therefore not interfere with other electronic devices. Persons who have heart pacemakers or other electronic implants should discuss with their doctor or the manufacturer of the implant as to whether this device is sufficiently safe from interference.
- To maintain the best possible temperature monitoring of the cookware, it should be as even as possible. For cookware with a large air gap over the center point of the cooking element, such as, for example, stamped imprints with the manufacturer's logo, the temperature monitoring is negatively affected and can cause overheating of the cookware. Damaged cookware, e.g. deformed bottom surfaces due to overheating, must not be used.

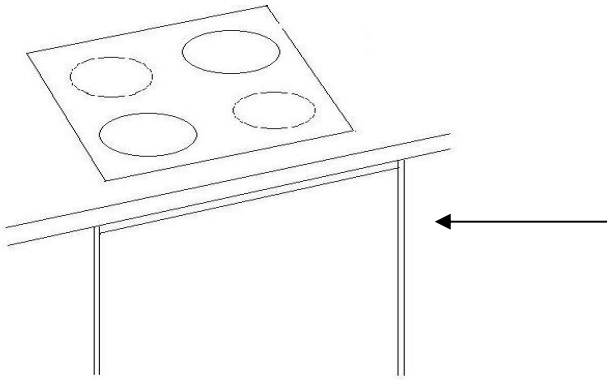
- The cookware must be place directly and centric onto the glass ceramic and should be centered. In no case anything may be between cookware and glass ceramic during cooking e.g. a trivet!

8.2 Requirements for glass ceramic

For induction cooktops it is only allowed to use glass ceramic with a thickness of 4mm. The serigraphy of the glass has to ensure that a pot definitely covers the temperature sensor while cooking. The temperature sensor is in the middle of the coil and is ideally covered with the middle of the pot. In case of bridge mode (e.g. connection of two Octa inductors) the serigraphy needs to ensure that both temperature sensors are covered. The described features of the "G5 induction" are only guaranteed for intended use. If other glass thicknesses are used or if the temperature sensor is not covered while cooking it can lead to risks or unwanted properties.

8.3 Mounting instruction for cabinets

The build in situation of the cooktop in the cabinet effects the capability of the cooktop. The integrated cooling unit needs sufficient cold air at the inlets to avoid early cooking limitations.
It is important to avoid that the warm air from the outlets is easily retaken by the blower of the air inlet. It is recommended to specify an aperture in the furniture to blow out the cooling air.



9 Fehlercodes (Standard E.G.O.)

Error codes are shown on the display of the UI as assistance in case of service. A special document **"Error codes G5"** provides a more detailed error matrix in order to support service technicians.
This list shows the standard error codes, customer specific Touch Controls, deviating error displays can be implemented. As Standard general TC errors „Er xx" and cooking element specific errors E/x are distinguished. In case of E/x, the display of the affected element blinks with "E" and hexadecimal noted error code "x".

Error code	Description	Possible cause of error	Remedy
Er 03 and continuous tone or	continuous sensor activation; TC turn off after 10 sec	Water or cookware on the glass over the touch control sensors	Clean the control surface, remove objects on the sensors
Er 20	Flash memory – TC error	µC- defective	Replace TC
Er 22	Button evaluation defective, UI shuts off after 3.5-7.5 sec	Short or open circuit in the area of the button sensoric	Replace TC
Er 31	Incorrect configuration data or deviation between generator and TC	New configuration of the induction generator required	New configuration (Service menu)
Er 36	NTC value defective on TC; UI turns off	Short or open circuit of NTC	Replace TC
Er 47	Communication error between TC and induction	No or erroneous LIN communication! (Slave does not answer to request of master)	Connection cable not correctly plugged in or defective.
U 400	Continuous tone Power supply on inlet to high	Incorrect connection of the cooktop	Correct power supply connection
E / 2	Excess temperature of the induction element	Overload of cooktop or empty boiled cookware	Let system cool down.
E / A	Error on the power board	Component failure	Replace power board
E / 6	Error on power board or supply element	No power supply of the power element or error on power board	1. check wiring 2. check filter board 3. replace power board
E / 8	Incorrect fan speed	Error on fan left or right	Air exhaust blocked, e.g. by paper Replace Defective fan
E / 9	Defective temperature sensor on inductor		Replace inductor Replace power board

10 Spare parts, Customer Service

Spare parts kits with replaceable assemblies and components are available for use during service.
Error codes from Chapter 9 help to find the defective parts. Based on an error matrix, a suitable procedure for repair will be suggested. Important information for replacement of assemblies can be found in the photo documentation.
Spare parts for different generators or heater types can vary because of differing equipment.
Spare parts are mainly ordered as individual parts or as a kit and packaged for transport as a package.

Basically the following assemblies or components are offered as spare parts:

- Power element kit
- Filter board kit
- Inductors
- Touch Controls
- Fan

The minimum order value for a spare parts order is 500 €.

11 Accessories

11.1 E.G.O. specific accessories

The required E.G.O. specific accessory parts for the induction Generation 5 are listed in the following:

Housing cover for generator (main connection)	968.265	(750 pcs. / carton)
Strain relief	968.199	(1,000 pcs. / carton)
Screws for strain relief	969.173	(1,000 pcs. / carton)
Short circuit bridge	75.97009.001	(1,000 pcs. / carton)
Fastening clip for 1.5 mm mounting plate for TC, oval	969.319	(2,000 pcs. / carton)
Connection cable from generator to UI (400mm)	955.287	(500 pcs. / carton)

11.2 Specifications/References for other accessories

LIN cable

- 1-pole with 265mm length — E.G.O. drawing 955.471
- 4-pole with 400mm length (both ends coded) — E.G.O. drawing 955.310

Cable for code switch 44.02020.xxx

- 5-pole with 400mm length (both ends coded) — E.G.O. drawing 955.357

12 Drawings

The composition of the E.G.O. article numbers of the Induction Generation 5 is described in chapter 14.2.

Important dimensions and details for the generators can be taken from the following drawings:

75.08012.002	4-burner induction generator G5
75.08012.004	3-burner induction generator G5
75.08011.004	2-burner induction generator G5
75.08011.012	1-burner induction generator G5
75.08016.002	additional converter induction G5

Important dimensions and details of the inductors can be taken from the following drawings:

75.95050.501	Inductor Ø 145mm; 2.2kW boost power
75.95050.504	Inductor Ø 145mm; “Teppan Yaki“ with 1.8kW boost power
75.95051.501	Inductor Ø 180mm; 3.0kW boost power
75.95052.501	Inductor Ø 210mm; 3.7kW boost power
75.95053.501	Inductor Ø 260mm; 3.7kW boost power
75.95054.531	2-circuit inductor Ø180/260mm; 3.0/5.5kW boost power
75.95055.501	184x220mm "OCTA" with 3.7kW boost power
75.95056.501	Inductor 270mm WOK with 3.0kW boost power
75.95006.501	Inductor 180x280mm "Oval”; 3.7kW boost power

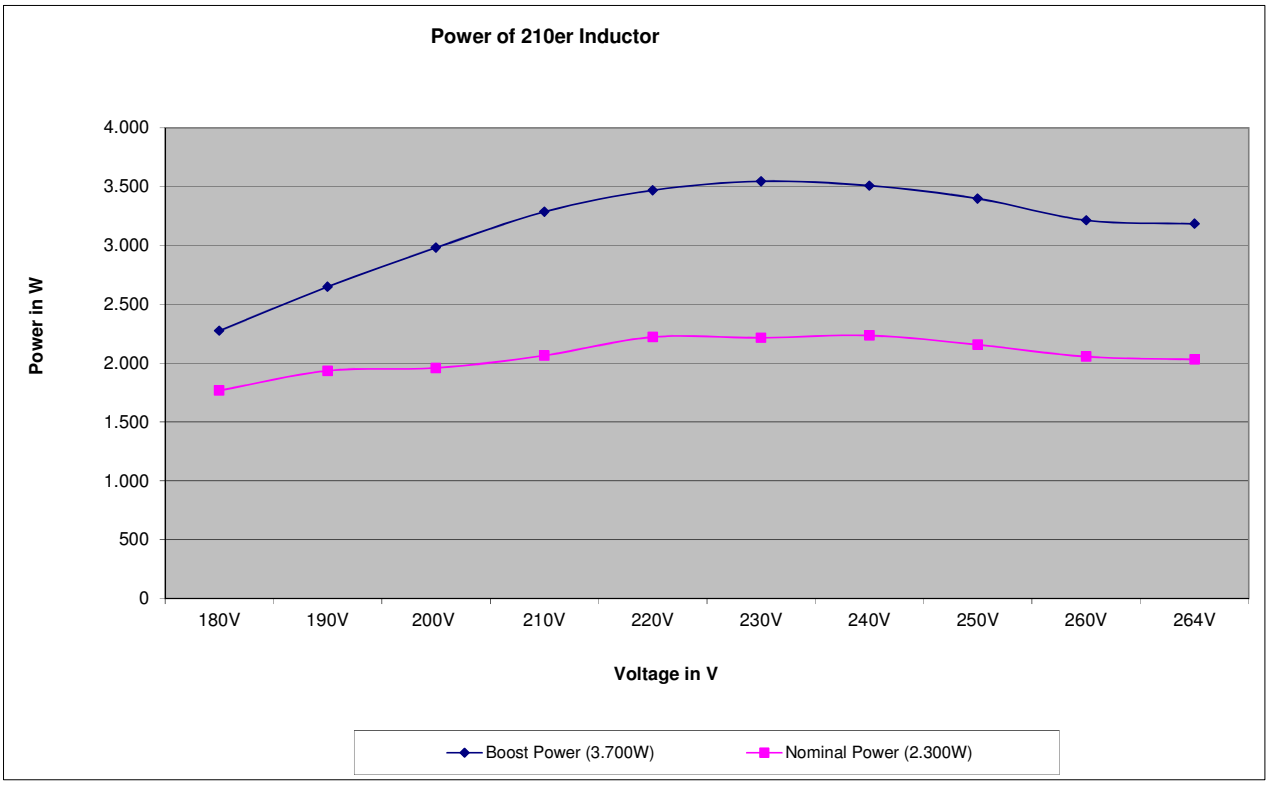
Important dimensions and details of the user interfaces can be taken from the following drawings:

75.13196.301	E.G.O. Touch Control Lite Slider
75.13137.001	E.G.O. Touch Control Lite
75.13100.302	E.G.O. Touch Control Multislider
75.13106.415	E.G.O. Touch Control Flex (Master)
75.13106.608	E.G.O. Touch Control Flex (2-burner Slave)
75.13106.854	E.G.O. Touch Control Flex (1-burner Slave)
75.13060.301	E.G.O. Select Touch Control (vertical)
75.13060.801	E.G.O. Select Touch Control (horizontal)
75.13168.901	E.G.O. Front Touch Control (1 or 2 cooking zones)
75.13069.301	E.G.O. Front Touch Control (3 or 4 cooking zones)
75.13070.301	E.G.O. Front Touch Control (3 or 5 cooking zones)
75.04005.101	E.G.O. Knob Control K6 with 3 to 6 zones
980.449	E.G.O. interface board for Knob Control K6 with 3 to 6 zones
75.04004.001	E.G.O. interface board for Knob Control with 1 to 4 zones
75.04004.201	E.G.O. display board for Knob Control with 1 to 4 zones

13 Normal power

13.1 Power of the inductor Ø210mm with different voltages

Exemplary the following diagram shows the boost and nominal power of the inductors Ø210mm with different voltages between 180V and 264V.



13.2 Power and detected diameter of different pots

manufacturer, type	mag. ø (mm)	Coils											
		145 mm		180 mm		210 mm		260 mm		Oval		Octa	
		P	9	P	9	P	9	P	9	P	9	P	9
Silit, Silargan	108	2,16	1,51	2,63	1,67	1,62	1,52	1,24	1,23	1,02	1,02	1,46	1,46
	130	2,0	1,5	3,1	1,95	2,55	2,05	1,89	1,81	1,39	1,38	2,69	2,08
	150	2,0	1,49	2,93	1,94	2,70	2,35	2,49	2,19	1,89	1,81	3,04	2,09
	185			2,82	1,93	2,93	2,35	2,65	2,65	2,92	2,23	3,25	2,08
	210					3,05	2,36	2,59	2,62	2,97	2,39	3,25	2,12
	285							3,05	2,70	3,46	2,33	3,25	2,12
WMF, Transtherm Gala Serie	108	2,26	1,5	2,15	1,35	1,03	1,01	0,81	0,86	0,83	0,92	1,08	1,08
	149	2,26	1,43	3,05	1,86	1,96	1,90	1,50	1,38	1,24	1,24	2,08	2,02
	189			3,05	1,86	3,71	2,30	2,49	2,42	1,81	1,8	3,48	1,96
	229					3,64	2,25	3,67	2,64	3,56	2,26	3,46	1,93
	259							3,63	2,56	3,55	2,19	3,46	1,93
Fissler, Cookstar	145	2,27	1,45	3,110	1,91	1,85	1,72	1,48	1,45	1,15	1,13	1,42	1,39
	180			3,05	1,86	3,57	2,35	2,11	1,55	1,55	1,55	3,53	2,00
	210					3,63	2,27	3,56	2,66	3,49	2,26	3,49	1,98
Demeyere, Tripl-Induc	139	2,26	1,45	3,11	1,91	2,02	1,46	1,76	1,37	1,48	1,22	1,76	1,75
	178			2,78	1,86	3,10	2,38	2,63	2,32	2,36	2,11	3,67	2,07
	218					3,17	2,30	3,17	2,68	3,66	2,35	3,45	2,04
	260							2,89	2,62	3,37	2,35	3,45	2,04
ELO, Black Line	119	1,58	1,25	1,6	1,05	0,40	0,27	n.d.	n.d.	n.d.	n.d.	0,35	0,25
	151	2,0	1,48	2,16	1,43	1,28	0,98	1,05	0,82	0,93	0,65	1,37	1,38
	176			3,02	1,86	1,77	1,47	1,43	1,17	1,49	0,99	2,19	1,78
	210					2,82	2,29	1,89	1,76	2,16	1,6	2,45	1,98
Iittala	153	1,63	1,45	2,44	1,95	2,34	2,14	2,15	1,92	2,08	1,59	2,73	2,12
	223			3,04	1,84	3,62	2,25	3,68	2,63	3,56	1,47	3,45	1,95
Tefal, Jamie Oliver	123	2,3	1,47	2,47	1,53	1,53	1,24	1,23	1,13	0,96	0,95	1,38	1,43
	184	2,26	1,46	3,07	1,87	3,43	2,32	2,30	2,23	1,71	1,7	3,51	2,00
	210					3,69	2,30	2,71	2,39	1,94	1,91	3,50	1,99
BergHoff	137	2,26	1,43	3,07	1,88	1,8	1,71	1,31	1,31	1,2	1,2	1,71	1,70

n.d. Not detected

Not measured, since already full covered

14 Approval

14.1 General

During the device authorization it is recommended to authorize the E.G.O. induction system as a unit based on the E.G.O. approval, so as not to have to repeat your own device approval due to unavoidable expansions and/or changes of safety critical components during the service life of the product. Furthermore it is recommended to use the article numbers according to chapter 14.2.

The EGO induction G5 is approved by the following test institutes:

- VDE

The CB report of the E.G.O. component approval at VDE can be requested if needed.

14.2 E.G.O. type numbers with Induction G5

The type numbers with E.G.O. are extensively speaking.
The 8th numeral of the E.G.O. type number is used as index, therefore successor types with adapted specification (e.g. necessary changes due to modification of relevant IEC standard) may be educed from the speaking character of the type code:

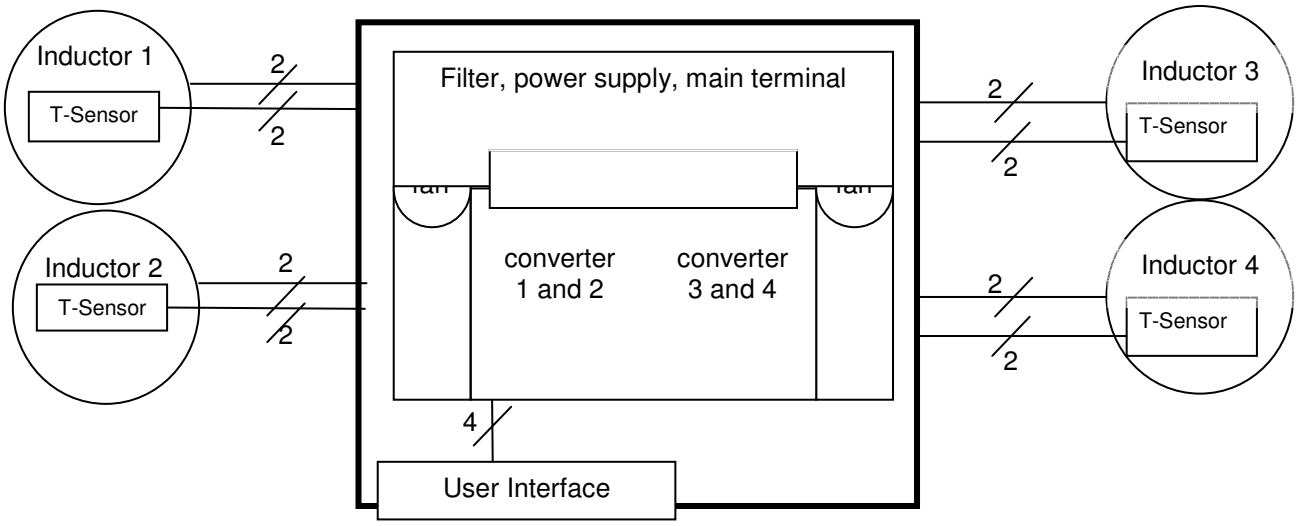
3-/4 burner generator:	75.08012.XYY	Index X (Start with 0, count up to 1, 2,..)
3-/4 burner Heating system:	75.08012.XYY	Index X (Start with 5, count up to 6, 7,..)
Domino-Generator	75.08011.XYY	Index X (Start with 0, count up to 1, 2,..)
Domino- Heating system	75.08011.XYY	Index X (Start with 5, count up to 6,7,..)
Additive converter	75.08016.XYY	Index X (Start with 0, count up to 1, 2,..)
Combined-Heating system	75.08016.XYY	Index X (Start with 5, count up to 6,7,..)

Remark

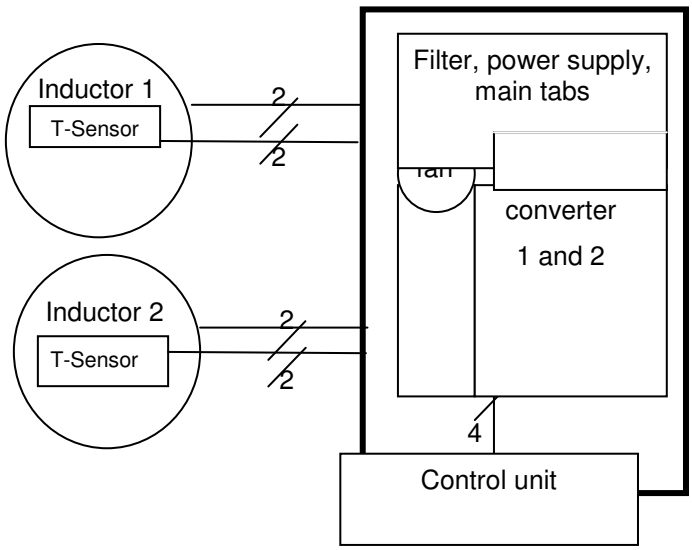
- YY is ongoing numbering of version
- A combined-Heating system consists out of minimum two generators, e.g. 2x 2burner generator for Panorama-cooktops, 4-burner generator with additive converter or 2 burner in combination with 3-burner generator used for 5 element cooktop.

15 Schematical diagram

15.1 Induction system with a 4-burner generator



15.2 Induction system with a 2-element generator



16 Flow diagram for sequence of a configuration