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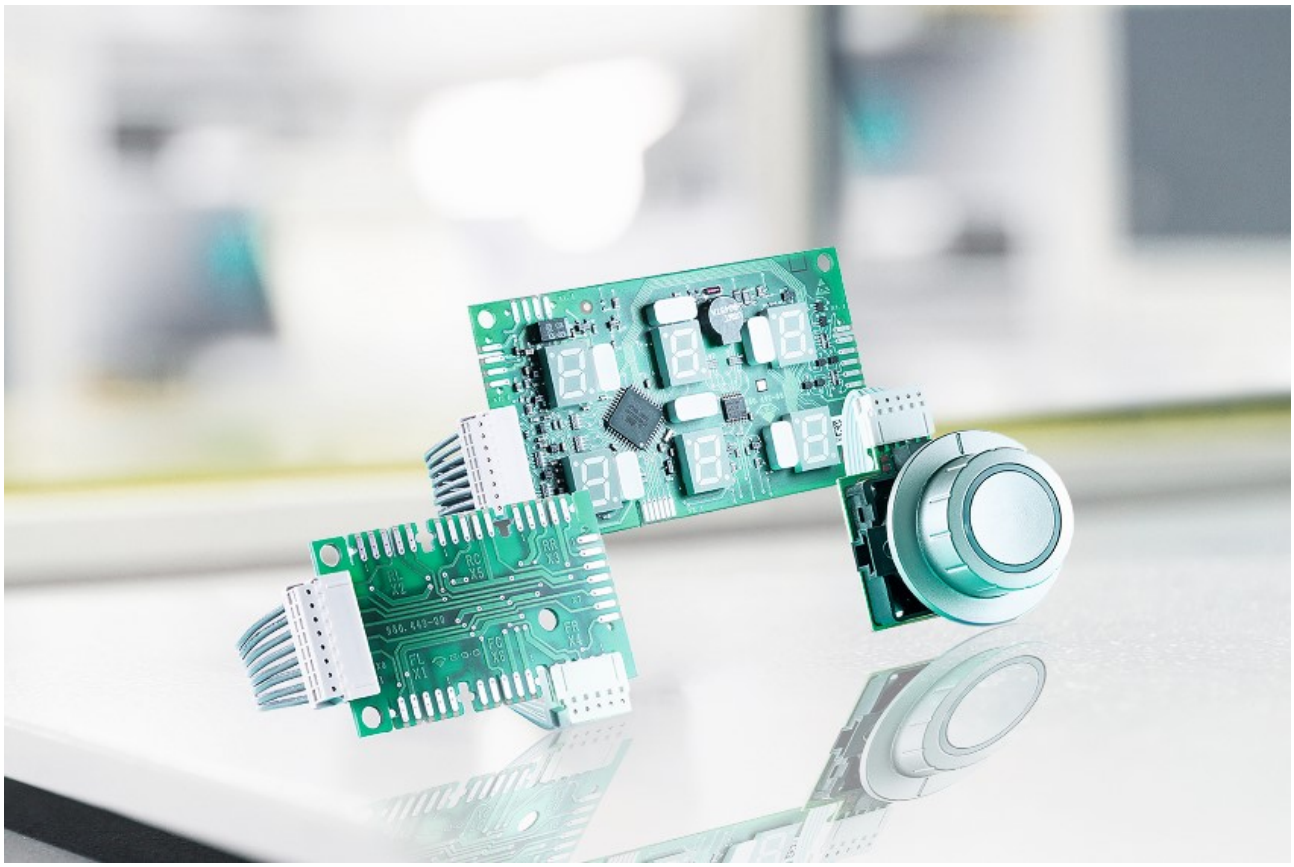
Functional Description of

EGO Knob Control K6

Types: 75.04005.xxx

75.04007.xxx (K6 Redesign)



Change history

Responsible (EKP)	Date	Change
D. Selimic	29th June 16	Initial release
C. Chmielewski	21st November 16	Warming temperatures updated (chapter 2.2)
C. Chmielewski	28th September 17	Power Management for Induction Basic 2 added (chapter **Error! Reference source not found.**)
D. Selimic	19th Februar 20	Maintenance and repair added
D. Selimic	2020-09-29	Ch. 3.8 (Powermanagement Menü)/ 3. X1 replaced by X4
J. Kazmierczak	30.09.2022	Heat-up Time Automatic: Activation 1 sec. instead of 2 sec. like Inquiry Sheet and like most customers are using it
J. Kazmierczak	13.10.2022	K6 Redesign (New material no., additional overtemperature switch-off)
J. Kazmierczak	20.10.2022	Lifetime for the K6 display board (added) Ambient Temperature in Operation (more detailled) Humidity (added) Storage Temperatures (more detailled)
J. Kazmierczak	28.10.2022	**Error! Reference source not found.** (added) Boost Function (Basic 4 added) Bridge function (Basic added) Child Lock Function (CL) (additional Remark) Power Management (Basic added) Power Level / Range of angle / Operating Time Limitation (Basic 2 and 4 added) Service Menu (activation with a single knob control added) Demo mode (added) Stand- by Consumption (not for RHE) Transport (Update)
J. Kazmierczak	26.01.2023	Mounting (added)
J. Kazmierczak	31.01.2023	Humidity (Update)
J. Kazmierczak	22.02.2023	ON / OFF (adjustment of light up & sound behaviour)
J. Kazmierczak	03.04.2023	Service Menu at G5 and Gx Induction (Adjustment of activation)
J. Kazmierczak	03.07.2023	Error Output and Management (Adjustment E/x error codes)

J. Kazmierczak	26.07.2023	Gx added
J. Kazmierczak	28.08.2023	Activated Child Lock Function (Adjustment of display)
J. Kazmierczak	29.08.2023	Knob Control Unit (Adjustment of induction configurations)
J. Kazmierczak	20.11.2023	Installation conditions (Update)

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RHE *Radiant Heating Element*

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.

Changes which require an information to the customers:

- Software changes with obligation approval effects or functional effects
- Component changes with obligation approval effects or functional effects
- New dimensions of hardware devices referring to customer drawing (e.g., cable guide, fixations, housing changes, ….)
- Change of production locations by E.G.O.
- Changes of internal key processes with possible impact to product functionality

Changes which require no information to the customers:

- Correction or upgrading the software or hardware without effect to approval
- Updates and corrections on drawings without effect for the application
- Changes of internal processes without effects to the product functionality

Security of supplying ability

To secure the supplying ability, E.G.O. reserves the right to change standard components on a short- term basis. In that case components or producers of equal or higher quality will be used.

Differences will be discussed between E.G.O. and its customers.

Changes of standard components

Changes of suppliers (e. g. PCNs about raw materials, processes and locations) that are not mentioned above will not be passed to the customer.

1. Application Area of the EGO Knob Control K6

EGO Knob Control K6 is designed to be used in systems together with:

- Induction G5
- Induction Gx
- Basic 2
- Basic 4

1.1. System Description of the EGO Knob Control K6

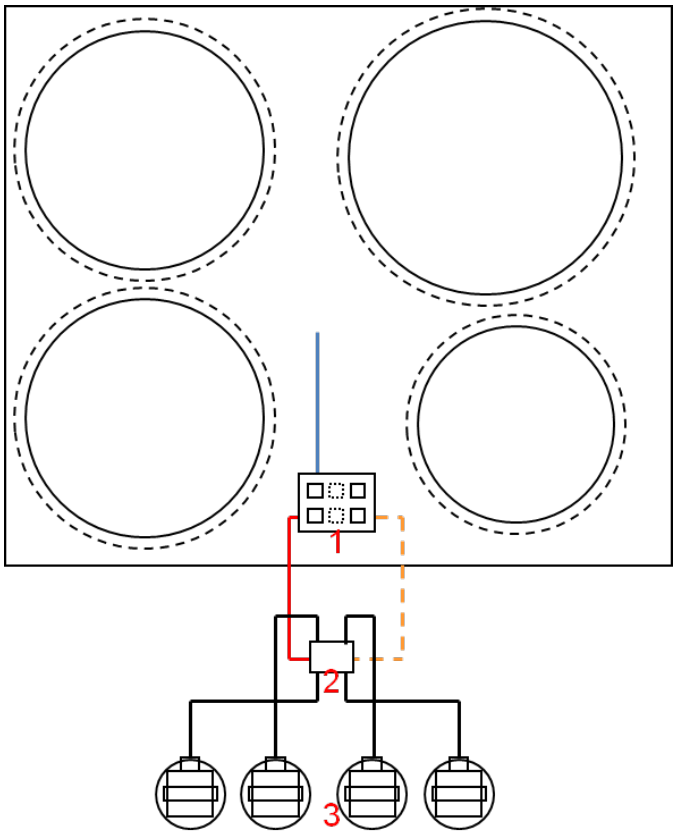


Figure 1: EGO Knob Control K6 – Connection scheme and placement in cooktop

EGO Knob Control K6 system includes a display unit (1) and an interface board / splitter PCB (2) to connect to 6 analogue potentiometers / knobs (3). The system can be used in ranges or cooktops. The knob control unit is connected to the induction generators using the LIN BUS. The system can display up to 6 cooking zones as well as 6 additional symbols. Drawings to the system overview, the cabling as well as the allocation of the knobs to the cooking zones are to find in the attachment.

1.2. EGO Knob Control K6- System Assembly

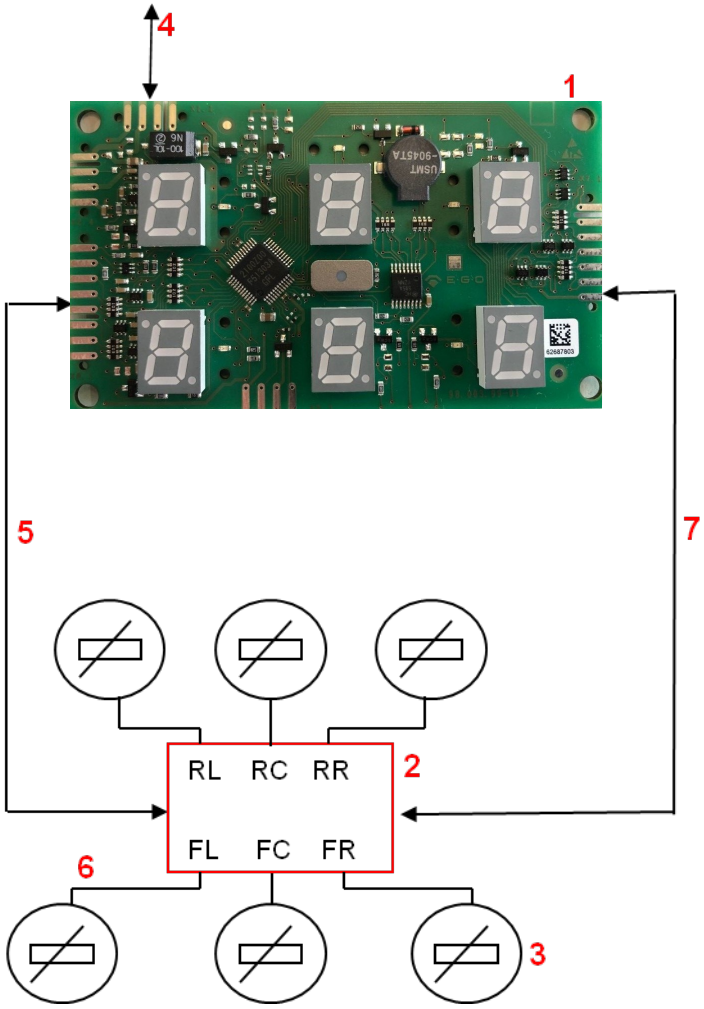


Figure 2: EGO Knob Control K6 system– connection diagram

1 Display unit

2 Interface board / splitter PCB

3 Knob control units for up to 6 cooking zones (front left- FL, front centre- FC, front right- FR, rear left- RL, rear centre- RC, rear right- RR)

4 LIN- Bus connection to induction generator

5 8-pin LIN- cable: +/-, -/+, 6 x A/D

6 Three or five pole LIN- cable

7 7-pin LIN- cable: +12V, 6 x LED (open collector)- optional for lighted knobs

1.2.1. Display Unit

The display unit is designed compatible with four cooking zones. The module can be fixed with standard spacers. E.G.O. special designed housing is not available. Up to 6 cooking zones are supported by the hardware. A buzzer for acoustic feedback can be implemented optionally. It is possible to implement 6 further optional symbols (hot status, dual zone, bridge function etc.) in addition to the 6-cooking zone displays. The display unit is the LIN-bus master. The interface board needs to be connected to the display unit using an 8- pin cable. For illuminated knobs an optional 7- pin cable can be connected.

1.2.2. Splitter PCB

The splitter PCB (980.449) is required to connect the knobs to the display unit. Ideally it is located close to the knobs. An 8-pin cable connects the display unit with interface board. Up to 6 knobs can be handled by the interface board. It is also possible to drive LED's for illuminating the knobs. The interface board only passes the actual rotation angle from the knobs to the display unit which processes the signal. The knob connecting position to the interface board determines which cooking zone can be controlled. In order to be flexible to use identical cables for all knobs there is no coding according to the positions. The assignment of cooking zones can be taken from the drafts in the attachment. The PCB contains a printed label on each connector referring to the cooking zone connected. Measurement details can be found on the type number drawing 75.04005.xxx. The board contains three holes with a diameter of 3.9 mm for fixation.

1.2.3. Knob Control Unit

Turning the knobs allows the user to control the hob in a simple, fast and familiar way. The power of the according cooking zone can be increased by turning a knob clockwise. To reduce the power of the cooking zone it is necessary to turn the knob anticlockwise. The current power level is displayed on the display unit. The knobs have a locking position for the zero level and two over winding positions with limit stop from which the knob turns back automatically. These can be used to activate special features. Up to 14 positions are defined for this variant:

- Special function OWL- over winding to the left
- Special function OWR- over winding to the right
- Off function
- Special feature 1- melting function (G5 and Gx induction)
- Special feature 2- warming function (G5 and Gx induction)
- Special feature 3- simmering function (G5 and Gx induction)
- 9 power levels- 1 to 9

The knobs are specified as linear potentiometers. Measurement details can be found in the type number drawing 44.02020.010.

ATTENTION: 44.02020.010 is not compatible with 44.02020.000!

The knob control unit contains a maximum of 10 different induction configurations. The configurations differ in the generator types. The according configuration can be selected from the service menu. As default the configuration “0” is selected.

1.2.4. Connecting cables

The all connecting cables: 8- pin connecting cable between the display unit and the interface board, 4- pin LIN connecting cable between the display unit and the induction, 7- pin connecting cable for driving the LED’s on illuminated knobs, 3- pin connecting cable between the knobs and the interface board and 5- pin connecting cable for illuminated knobs **are not included** in delivery scope of EGO Knob Control K6.

It is recommended that the customer orders all required cables direct from a cable manufacturer.

1.2.5. Illuminated Knob (Optional)

Four LEDs can be implemented to illuminate the knob on the knob- PCB. If the illumination option is requested a concept should be developed with the customer and an individual offer must be worked out. The PCB provides a 2x2 connection for the four LEDs. Two LEDs are connected in series and then parallel with the others two. Each LED has a series resistor to be connected to 12V hence actually we can provide red colours. In order to drive blue or white LEDs an adaption of the PCB- board is required.

2. Functions

2.1. ON / OFF

In idle mode all displays are dark except a hot surface needs to be signalled. If at least one knob is turned out from the locked zero position all cooking zone displays on the display unit light up. If permanent pot detection is activated only the cooking zone displays with a cookware light up on the display unit. The current power level of the according cooking zone is displayed, and all the other cooking zones remain off. If a buzzer is available a sound is played as soon as a knob is turned from the locked zero position to switch a cooking zone on. The control can also be switched on activating the heat up automatic. In order to turn the knob from the zero locked position the residual torque must be transcended. The power level set is displayed. The acceptance of power level by induction module is delayed by about one second. If the knob is turned to zero locked position the display disappears and indication for possible residual heat is displayed. If a buzzer is implemented a signal is emitted when the control is switched off.

2.2. Warming Function (only G5 and Gx Induction)

If the knob is turned clockwise from zero position the first “power level” reached is the melting function. The according 7 segment display unit shows symbol as Figure 3.

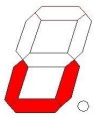


Figure 3: Indication of melting function on 7-segment display

The warming function is the second “power level” which can be selected when turning the knob clockwise. The according 7- segment display unit shows symbol as Figure 4.

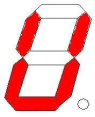
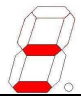
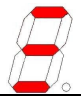


Figure 4: Indication of warming function on 7-segment display

Warming function is intended to keep boiled food warm. Depending on the used induction platform, 1 or 3 different warming levels are possible.

- Basic Inductions provide no temperature control but dissipate a defined fixed power level allocated to the warming level. Just as for RHE is the warming between levels 0 and 1.
- G5 inductions provide temperature-controlled warming levels. The temperature values for the warming levels are stored in the induction.
- Gx inductions: Values of the warming function can be adjusted in a user interface variant by request.

Level	Symbol	Description	Temperature
Level 1		“ Warming“	42 °C (Variants specified before 2016-12) 44 °C (Variants specified after 2016-12)
Level 2		“ Melting“	70 °C
Level 3		“Simmer“	94 °C

Remark: The first and second levels (melting and warming) can be defined dependently of variant. The third keep warm level 94 °C is fixed temperature value.

For more details considering the behavior of the warming function, see the user documentation of the

corresponding induction platform.

2.3. Heat-up Time Automatic

To activate the heat up time automatic turn the knob in the left overwind position “OWL” and hold the knob in that position for 1 sec.

Figure 5: Indication of heat up automatic on 7-segment display

A valid cooking level, called continued cooking level, has to be selected within the next 10 sec. This is the continues cooking level after a defined time of higher power output. The 7 segment display alternates between “A”- Figure 6 and the value of selected continuos cooking level. The heat up time automatic is not activated if the OWL position is followed by selecting levels 0, 9, warming, melting or OWR.

2.4. Boost Function

To activate the boost function, turn the knob in the right overwind position “OWR”. The symbol is displayed on the according 7- segment display- Figure 6.

Figure 6: Indication for active booster on 7-segment display

The boost function is automatically switched off and the “P” disappears after 15 minutes (Gx induction) 10 minutes (G5 induction) or after 5 minutes (B2 and B4 induction). The further details of the boost function are to find in the specification of the inductive cooking system.

2.5. Bridge function

Bridging of 2 cooking zones is the connection of 2 single cooking zones, so they can be controlled and will behave as one large cooking zone. This enables using cookware which has a larger bottom surface than a single cooking zone. In some inductive cooking systems two similiar cooking zones can be “bridged”- Figure 7.

Figure 7: Indication of bridge function
“master” and “slave” cooking zones on 7-segment display

Remark: Only the vertical pairs (e. g. left front and rear cooking zone, right front and rear cooking zone) can be bridged. Both bridges (left and right) can be used simultaneously. The maximum power in bridge mode is adjusted in a way to achieve an equal power distribution without overloading the induction generator.

I.e. those two cooking zones bridged behave like one cooking zone and can also be controlled like only one. One of the two cooking zones (the rear or right) is the “slave cooking zone” the other bigger (front or left) is the “master cooking zone”. The knobs for control the two bridged cooking zone must be simultaneously turned in the right overwind position (OWR). They need to be hold in that position for a least 2 sec. The knob for the “slave cooking zone” must be turned to level 9. The cooking level can be set with the knob of the master cooking zone. The display belonging to the slave cooking zone shows the above bridge symbol. Optionally the luminous cap can be implemented on the top left.

If permanent pot detection is active for Gx induction same cooking zones will be bridged vertically when a cookware is detected on both zones.

2.6. Pot Detection (Induction)

The E.G.O. pot detection function of all inductive cooking systems is supported via LIN from the knob control unit.

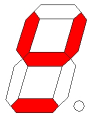


Figure 8: Indication of “missing cookware”
on 7-segment display

The cooking level can be selected by turning the knob to the according position even if no cookware is present. The output of power starts automatically as soon as an appropriate cookware is put on the cooking zone. If the knob position is changed the display shows the according power level. If no cookware is detected a “missing cookware” symbol is displayed after a short time. This symbol is shown until an appropriate cookware is put on the cooking zone or the maximum time of 10 minutes expired. The same applies if the cookware is removed during normal cooking. After 10 minutes without detected cookware the cooking zone switches off automatically and can only be activated again after returning the knob into the zero position. The sensibility of the pot detection is defined in the according specification of the inductions cooking system.

2.7. Child Lock Function (CL)

The CL can be enabled by turning the first two knobs from the left (knobs which are connected on the splitter board X1 and X2 simultaneously into the left overwind position (OWL).

Figure 9: Indication of lock function on 7-segment display

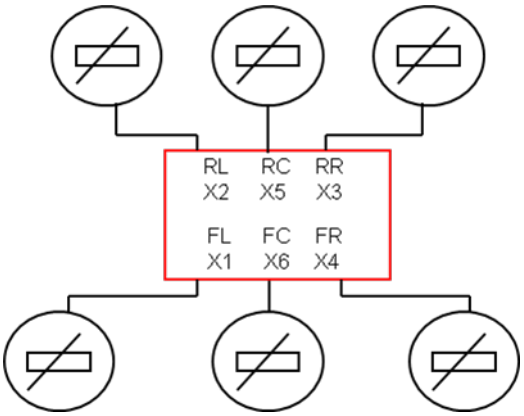


Figure 10: Assignment of knobs on the K6 splitter board

The knobs need to be hold in OWL- position for at least 3 sec. The activation is displayed on all 7 segment displays defined in the system- Figure 10. If the knobs are not hold in the OWL position for long enough the CL will not be enabled / displayed. The input is invalid, and an error message will be displayed (flash symbol) if the knobs are hold in OWL- position for longer than 30 sec. If the CL function is active the cooking zones cannot be switched on even if the knobs are turned in a cooking level position other than zero. The CL function is not time limited. A mains power failure which exceeds the specified hold-up time deactivates the CL function. If in a case of mains power failure any knob is in a position different from zero- no power output occurs. In order to deactivate the CL function repeat the same procedure as at activating. After unlocking all knobs must be turned back in the zero position if any knob was in a position ≠ 0. The control is off and can be operated as expected.

Remark: If the switchable Power Management is available, it is not able to activate the Child Lock in the first two minutes after mains connection on as this knob combination is blocked for the Power Management Menu in this time.

2.8. Residual Heat Indication

Cooking zones already switched off can still have a hot glass surface. In order to warn and protect users from burning themselves this situation is visualised.

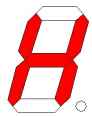


Figure 11 Indication of residual heat on 7-segment display

The E.G.O. residual heat display indicates this situation on the 7- segment display of the according cooking zone- Figure 12. The 7 segment display shows [H] or alternatively a luminous cap can indicate the HOT symbol. The knob control does not save this residual heat value but receives status information from the induction through the LIN.

The temperature sensor of each inductive cooking zone measures the residual heat is. If the measured temperature drops below 60 °C on the glass the symbol indicating the hot surface disappears.

2.9. Automatic Switch-off (Operating Time Limitation)

The E.G.O. operation time limitation is implemented. Depending on the chosen cooking level and if no change of cooking level is done a maximum operation time limitation is defined. If a maximum operating time is exceeded the cooking zone is switched off. To reactivate this cooking zone, the control knob has to be turned back into zero position. After each user operation the remaining time until automatic switch, off is reset to the defined operation time limitation for this cooking level. The detailed operation time according to the power level can be taken from the part 3.

2.10. Power Management

K6 Knob Control in conjunction with the induction platform supports a power management to prevent the mains connection from overloading (typical limitation: 16 A / 3.7 kW per line conductor).

2.10.1. Prioritizing Power Management

The power management is prioritizing, i. e. the cooking zone with heating power increasing at last get the desired heating power and the power of other cooking zone connected to the same line conductor is reduced. Additionally, the reduction of power is signaled to the user by the cooking level flashing.

2.10.2. Limiting Power Management

Processes in the case of limiting power management are analogous to those in the previous case of prioritizing power management. The peculiarity of this power limitation is evident when the second cooking zone is activated. The maximum heat setting for this cooking zone is in this case determined / limited by remaining power output.

2.10.3. Power Management for G5 and Gx Induction

The power management is independently done by the inductions system. For further details check the specification of the induction. Generally, the following rule applies: The latest set cooking level has priority. If it is not possible to output the required power on a cooking zone it will not be displayed. The display changes only when the actual cooking level is reached by turning the knob left.

2.10.4. Power Management for Basic 2 and 4 Induction

***ATTENTION**! This function can only be disclosed to professionals (i.e. service technicians). Setting a wrong configuration may cause overloading the grid.*

K6 Knob Control provides a configuration of the total power limitation of the cooktop combined with Basic induction. This feature is intended to be used for regional markets which usually provide grids with limited total power. For example, this can be used to configure cooktops for operation in grids with 1, 2 or 3 phases.

Remark: The configurable power limitation is a special feature and only implemented on customer's request.

Note: Configuring the power management as described below is only possible within 2 minutes after the power supply voltage has been switched ON.

1. Make sure that all knobs are on position 0.
2. Turn the knobs for the front left and the front right cooking zone (left and right knob) simultaneously to left overwind position and hold for 3 s. A signal tone is emitted.
   => The latest set power limitation is displayed on the 7-segment displays for the front left and the front left cooking zone in kW, e. g. 7.4..
3. Change the power limitations with another turn to the left for 3 sec. Mains connection and power limit can be set individually. The available settings depend on the variant of the touch control. Number of phases can be taken out of the configuration table. Optionally the number of phases can be shown on the 7-segment displays (on customer request).
4. Perform no action for 10 s. A signal tone is emitted.
   => The setting which is displayed will be saved permanently. The cooktop goes to standby mode.

2.11. Overheating Status of Cooking Zone

A temperature sensor for overtemperature protection is integrated in the K6 knob control. If the temperature exceeds 105 °C, the K6 knob control is switched off. Reaching 90 °C the K6 knob control can be switched on again.

If the power reduction is due to high temperature of cooking zone the power reduction is controlled by the user interface (display unit). This assures that the power cannot be increased again without changes made by the user. The knob has to be turned back to the power level indicated on the UI before the power can be increased again.

If the power needs to be reduced from the generator (i.e. heat sink temperature) the display unit doesn’t show it unless the reduction of output power is due to deactivation of the boost function.

2.12. Warming zone / warmer (only G5 Induction)

As a cost optimised extension to an inductive cooking system a conventional low power heating element (max. 200 W) can be added as a warming zone. The heating element can be controlled using a relay of the G5 generator. The warmer can only be on or off. There is no temperature sensor for this heating element. If a mains power failure occurs shorter than the hold-up-time the knob control unit must store the residual heat status of the warmer because the induction cannot provide it.

3. Power Level / Range of angle / Operating Time Limitation

3.1. G5 Induction

Cooking level / special function	Typical range of angle- no warming		Typical range of angle- with 1 warming level		Typical range of angle- with 2 warming levels		Typical range of angle- with 3 warming levels		Power [%]	OTL* [h]	Induction HUTA** [sec]
Activate bring to the boil / child lock									(100)		
Off	0	20	0	20	0	20	0	20	0	6.0	
Warming 1	-	-	21	48	21	46	21	45	0.5	2.0	
Warming 2	-	-	-	-	47	71	46	68	1.0		
Warming 3	-	-	-	-	-	-	49	90	1.5		
Level 1	21	52	49	78	72	97	91	113	3.0	6.0	48
Level 2	53	85	79	105	98	122	114	138	6.5	6.0	144
Level 3	86	116	106	133	123	148	139	160	11.0	5.0	230
Level 4	117	148	134	162	149	173	161	183	15.5	5.0	312
Level 5	149	179	163	190	174	199	184	206	19.0	4.0	408
Level 6	180	210	191	218	200	224	207	230	31.5	1.5	120
Level 7	211	243	219	248	225	250	231	253	45.0	1.5	168
Level 8	244	275	249	275	251	275	254	275	64.5	1.5	216
Level 9	276	295	276	295	276	297	276	295	100.0	1.5	
									Boost	10 min	

Figure 12: Table overview valid for E.G.O. standard G5 Induction

*OTL- operating time limitation

**HUTA- heat up time automatic

Note: When printing for levels 0 and 9 (as well as for A and P), observe the orientation on the mechanism (detent and end stop). Also, for the warming level / the first level after 0, the mechanics (spring behavior) should be considered.

3.2. Gx induction

Cooking level / special function	Typical range of angle- no warming		Typical range of angle- with 1 warming level		Typical range of angle- with 2 warming levels		Typical range of angle- with 3 warming levels		Power [%]	OTL* [h]
Activate bring to the boil / child lock									(100)	
Warming 1	-	-	21	48	21	46	21	45	-	2.0
Warming 2	-	-	-	-	47	71	46	68	-	
Warming 3	-	-	-	-	-	-	49	90	-	
Level 1	21	52	49	78	72	97	91	113	3.5	10.0
Level 2	53	85	79	105	98	122	114	138	6.5	5.0
Level 3	86	116	106	133	123	148	139	160	11.0	5.0
Level 4	117	148	134	162	149	173	161	183	15.5	4.0
Level 5	149	179	163	190	174	199	184	206	21.0	3.0
Level 6	180	210	191	218	200	224	207	230	33.5	2.0
Level 7	211	243	219	248	225	250	231	253	48.0	2.0
Level 8	244	275	249	275	251	275	254	275	64.5	2.0
Level 9	276	295	276	295	276	297	276	295	100.0	1
Booster									125.0	15 min **
Double Booster									150.0	15 min **

Figure 13: Table overview valid for E.G.O. standard Gx Induction

* OTL- operating time limitation

** After 15 minutes, the power level is reduced to level ‘9’

Note: When printing for levels 0 and 9 (as well as for A and P), observe the orientation on the mechanism (detent and end stop). Also, for the warming level / the first level after 0, the mechanics (spring behavior) should be considered.

3.3. Basic 2 and 4 Induction

Cooking level / special function	Typical range of angle- no warming		Typical range of angle- with 1 warming level		Power [%]	OTL* [h]	Induction HUTA** [sec]
Activate bring to the boil / child lock					(100)		
Off	0	20	0	20	0	6.0	
Warming	-	-	21	48	2.5	2.0	
Level 1	21	52	49	78	3.0	8.0	48
Level 2	53	85	79	105	5.0	6.0	144
Level 3	86	116	106	133	8.0	5.0	230
Level 4	117	148	134	162	12.0	5.0	312
Level 5	149	179	163	190	18.0	4.0	408
Level 6	180	210	191	218	28.0	1.5	120
Level 7	211	243	219	248	42.0	1.5	168
Level 8	244	275	249	275	64.0	1.5	216
Level 9	276	295	276	295	100.0	1.5	
					Boost	5 min	

Figure 14: Table overview valid for E.G.O. standard Basic 2 and 4 Induction

*OTL- operating time limitation

**HUTA- heat up time automatic

Note: When printing for levels 0 and 9 (as well as for A and P), observe the orientation on the mechanism (detent and end stop). Also, for the warming level / the first level after 0, the mechanics (spring behavior) should be considered.

3.4. Error Output and Management

Error codes are assistance in service case on the TC display. In general, are distinguished:

- E/x - cooking zone specific error / peripheral devices error (always cooking zone specific), are included in the induction documentation (refer to the customer documentation of the induction for details on those error codes)
- Erxx - general TC error, is composed of an error code (Erxx) and the module's type (ID)

Error output is displayed on RL (rear left) with [E], on RR (rear right) with [R] and the error numbers on the FL (front left) and on FR (front right) displays. The appropriate numbers are listed in table below. If a display announcement should be missing from a series, it will be displayed on the remaining place in the change.

The priority is defined individually within of each TC. In principle, a general error has a higher priority than any cooking zone specific error. In the same way, errors resulting in a TC shutdown have a higher priority than errors that only results in switching off a cooking zone. In the same way the previous has a higher priority than errors which are not involving heating power switching off. **Not all error messages are implemented in all TC. The custom error outputs are possible in addition.**

General TC errors- overview		
Error code	**Error description**	**Possible error cause/ debugging**
	Knob error	Permanent use of knob (> 30 s) / Release the knob
Er20	Flash / ROM- checksum error	µC error; Change the TC
Er21	Over temperature	Standard algorithm reaches limit when overheated; ambient temperature of electronic still too high; Let cooktop cool down; Check heat partitioning to TC
Er22	Key evaluation defect; TC switched off after 3.5 - 7.5 sec	Short circuit or discontinuation in range of key evaluation; Change the TC
Er31	Variant detection error	New configuration required
Er36	Temperature sensor error (master)	NTC value is not within specification value < 0.2 V or >4.9 V; TC switched off; Short circuit or NTC switching off
Er40	Power supply is too low for switching on	Primary PTC too hot; Disconnect TC from the power system
Er47	LIN-communication error	None or faulty communication; Ensure that connection cable is plugged on correctly and functional.
Er50	AD channel error	ADC reference voltage check failed or other failure

General TC errors- overview		
Error code	**Error description**	**Possible error cause/ debugging**
		in ADC path. Change the TC.
U400	Wrong connection	Power supply secondary is to high (Primary>300V); TC switched off after 1 sec releasing a permanent tone; Connect to correct main voltage

Figure 15: Table of general TC errors

3.5. Independency of the Knobs Under Fault Condition

The operation of all knobs is supervised. If one knob is not working proper all other cooking zones work still as expected. A cooking zone with an error is automatically switched off.

3.6. Cable Break or Wrongly Mounted Knob

This fault condition can not automatically be differentiated from the off state of a cooking zone. If a cable breaks or a knob is mounted wrongly the according cooking zone is guaranteed to be switched off (off-mode).

3.7. Permanent Use of Keys

If any knob is turned into a overwind position (OWL or OWR) for more than 30 sec continuously it is detected as permanent use of keys. The according display will show the flash symbol as error indicator. This cooking zone will be switched off into the off mode. If the knob is turned back from a overwind position the 30 sec countdown starts again. After clearing the error condition, the display of the flash clears after about 3 sec.

3.8. Clearance of Error Messages

The control unit has to detect that the faulty condition is fixed. After turning the knob back into the zero position new user inputs are allowed and will be accepted from the control unit.

3.9. Activated Child Lock Function

In this working mode the control unit only shows the error code and not the Child Lock symbol. During activation and deactivation of Child Lock function an acoustic signal is emitted while the error code is continuously shown. The displayed errors can be found in the attachment.

3.10. Blinking Scheme

The following possibilities exist for showing two or more symbols alternating on one 7-segment display:

Scheme	Duration of entire cycle	Number of symbols	Duration per symbol
1	1 sec	2	0.5 sec
2	2 sec	2	1 sec
3	2 sec	3	0.667 sec
4	2 sec	4	0.5 sec

The period between the symbols is always 10 ms.

3.11. Service Menu

***ATTENTION**! This function can only be disclosed to professionals (i.e. service technicians). Downloading the wrong configuration into inductive systems can destroy inductive power converts.*

Through the service menu different configurations can be selected. This allows flexible use of the UI for different range configurations (design of cooking zones). In the following description knob-L and knob-R will be referred to.

The knob-L is always the knob connected to the position X3 of the splitter PCB and knob-R is the knob connected to the position X4 of the splitter PCB (see also Figure 11). If the requested configuration does not have both knobs connected to the positions X3/X4 a specific setting has to be defined. To activate the service menu knob-L needs to be turned into the left overwind position (OWL) the display shows [A] while holding the knob-L in this position operate the following sequence with the knob-R:

1. Turn into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
2. Turn again into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
3. Turn again into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]

4. Turn knob-L back to position [0].

This sequence should be operated within 8 sec without interruption. The service menu is only accessible for the first two minutes after reset of the control system (i.e. after connection to the power supply for the first time).

Remark: To activate the service menu with a single knob control the knob needs to be turned into the left overwind position (OWL) the display shows [A] while holding the knob in this position operate the following sequence with the knob:

1. Turn into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
2. Turn again into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
3. Turn again into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
4. Turn again into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
5. Turn again into overwind right position (display [P]) and hold until a signal tone is emitted, then turn back to maximum level- typically display [9]
6. Turn knob back to position [0].

3.11.1. Service Menu at G5 and Gx Induction

If the service menu is activated the left display unit toggles between [C] and [0] and the right display unit shows 0., 1. or N. (corresponds to configuration number). The knob-R is back on the maximum power level after over winding to the right. To select the required configuration knob-L has to be turned into the left overwind position (OWL) while knob-R can be turned for select the level (0…9). The actual configuration is displayed on the right display unit. If the correct configuration is selected, turn knob-R back to the zero position. Now the configuration cannot be changed anymore turning knob-L. In order to download / activate the selected configuration now turn knob-L into the left overwind position and then also turn knob-R in the left overwind position and hold both for 1 second. To quit the service menu without changing the configuration turn the knob-R on the left overwind position “A” at any time. The UI then does a reset and can support up to 10 configurations.

3.11.2. Service Menu at Basic 2 Induction

In the cooking zone displays of not configured zones [C] appears in case of successful entry of the configuration mode. Already configured zones are indicated with [-]. A double beep indicates the breakdown of the entry due to any error touches.

A suitable pot must be put on the automatically selected (flashing [C]) cooking zone within 20 sec. The display symbol changes to [-] after detecting the cookware and the IHE is assigned to that control element of the UI. The configuration process must be done until all cooking zones are assigned. The configuration menu is cancelled after successfully assigning the last IHE or after 2 minutes without any sensor activation. Over winding the knob-L to the left, less than 5 sec, delete configuration procedure at any time.

Once an IHE is configured it is not possible to reconfigure it again. In case of wrong assignments, the complete configuration must be erased.

Turning knob-L clockwise in maximum position (9) starts the erasing procedure and allows new configuration setting of all connected IHE. Erasing procedure is indicated with a flashing [E] which will be displayed permanently if erasure process is finished. Turning knob-L back to zero position allows new configuration afterwards.

Important note: In any case can 2 cookwares be located on the cooktop during configuration, because the assignment should be well-defined. In case of wrong assignment all configurations must be erased and the complete configuration process for all zones must be redone.

In case of 2 IHE with same configuration inside a hob, as it can occurs after changing an IHE with a pre-configured one, this failure is mostly detected automatically and the failure code [E4] is displayed. The technician recognises that failure latest when the non-configured cooking zone can't be configured at all. In that case all configurations must be erased, and the configuration has to be redone completely.

3.12. Demo mode

The Demo mode enables all function of the knob control without any power dissipation of the induction. This can be used e. g. for fairs.

Remark: The Demo mode is only available for Basic 4, G5 and Gx induction. The Demo mode is a special feature and only implemented on customer's request.

To activate the Demo mode knob-L needs to be turned into the left overwind position (OWL) the display shows [A] while holding the knob-L in this position operate the following sequence with the knob-R:

1. Turn into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
2. Turn again into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
3. Turn again into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
4. Turn again into overwind right position (display [P]) and hold for 1 sec, then turn back to maximum level- typically display [9]
5. Turn again into overwind right position (display [P]) and hold for 1 sec. “de” is shown on the front display and a signal tone is emitted. then turn back to maximum level- typically display [9]

4. Turn knob-L back to position [0].

The deactivation process of the Demo mode corresponds the activation process.

Remark: The Demo mode is restricted to 120 sec.

4. Technical Data

The components are designed to be used on the EGO-LIN-bus and therefor have to meet the LIN specification. The inductive generators and inductive cooking units are separately specified.

4.1. Supply Ranges

• Rated voltage	200 – 240 V (+10 / -20%)
• Rated frequency	50/60 Hz
• Rated current	16 A per phase
• Nominal voltage (U_r)	230 V ± 1%
• Nominal frequency (f_r)	50 Hz

4.2. Under/over Voltage Protection

4.2.1. Under Voltage Protection

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

4.2.2. Over Voltage Protection (false connection 400 V 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 400 V.

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

4.3. Stand- by Consumption

The Stand- by consumption is defined by system switched off (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 consumption is P ≤ 0.5 W in all cooktops.

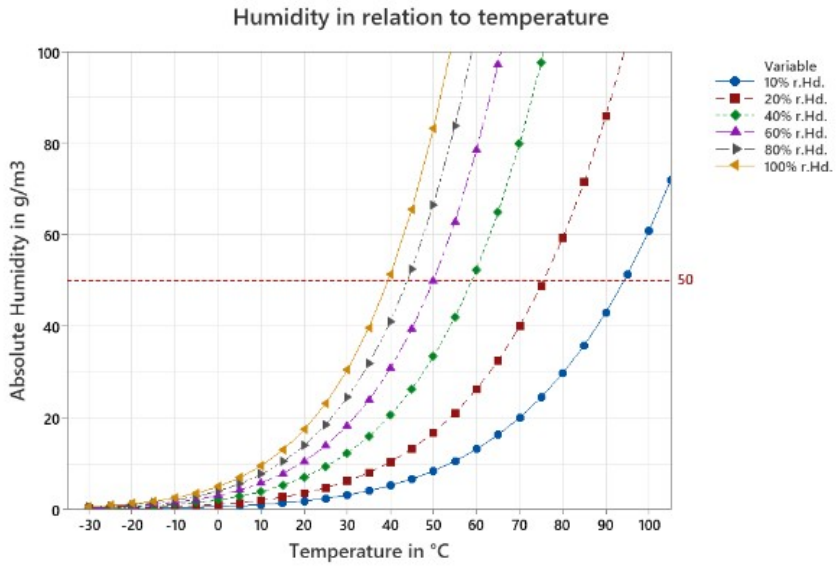
4.4. Ambient Temperature in Operation

- Interface board / splitter PCB: 0 ~ 105 °C
- Display unit (white/blue LEDs): 0 ~ 85 °C
- Display unit (red/yellow LEDs): 0 ~ 105 °C
- Code switch control unit: 0 ~ 85 °C

4.5. Humidity

- Admissible humidity: max. 93% rel. humidity (at T<40°C)

The absolute amount of humidity must not exceed 50 g/m³.
The absolute maximum rating values are not allowed to be exceeded at any times.



Remark: The diagram is only in the range -35°C to 35°C accurate. The higher the temperature, the less accurate the curve progression in the diagram become.

Remark: The absolute maximum rating values are not allowed to be exceeded at any time. Otherwise, the characteristics of the display module may not be recovered or it may be permanently destroyed. Avoid exposure of the unprotected display to direct sunlight or UV-light.

A condensation of TC- electronic in operation or storage has to be prevented in any case. Condensation may lead to short term functional disturbances and to long term total failures due to e.g. material migration. This also applies to possibly LIN- slave modules connected to the LIN- bus such as a RHE pot detection module. The UI has to be stored before applying the supply voltage, e.g. after mounting into the hob or after supplying the hob to the end customer, at least two hours at ambient temperature in order to prevent failures due to condensation.

4.6. Storage Temperatures

Valid for all components:

- Ambient temperature: -20 ~ 85 °C
- Admissible storage time: 2 years

4.7. Tolerances

- Interpretation of rotation angle:
- Rotation angle tolerance: +/- 10°

Remark: In order to prevent differences between knob position and power level displayed we do not advise the marking of any positions on the knob.

4.8. Turning Torques of the Knob

The knob control unit 44.02020.010 has a limit stop at the overwind positions. In order to not cut off the stoppers, the maximum turning torque must be limited. This must be considered when defining the knob size.

- The maximum allowable turning torque: max 100 cNm
- Required torque to quit the zero locked position to the right: 13 cNm +/-4 cNm
- Minimum torque to activate the left overwind position: 20 cNm
- Minimum torque to activate the right overwind position: 15 cNm
- Turning back torque from last detent to the left: 8 cNm +/- 2 cNm
- Run-down torque between 0 and last detent: 2 cNm +/-0.5 cNm

Applicable are the data found on the drawing of the knob control unit.

4.9. Lifetime

A B20 value of 3650h (confidence level = 90%) was statistically proven by a suitable test. This corresponds to a service life of 10 years (1h use per day). TC is during the entire lifetime permanently powered on the defined permitted voltage.

4.9.1. Lifetime for the K6 display board

Item	Value
Designed product lifetime	10 years, confidence interval 80 % • thereof 83,950 h standby time (15 °C) • thereof 250 h cooking time (30 °C) • thereof 300 h cooking time (40 °C) • thereof 400 h cooking time (50 °C) • thereof 600 h cooking time (60 °C) • thereof 800 h cooking time (70 °C) • thereof 400 h cooking time (80 °C) • thereof 400 h cooking time (90 °C) • thereof 300 h cooking time (100 °C) • thereof 200 h cooking time (105 °C)

4.9.2. Lifetime for the Knobs

- 90,000 hours,
- 30.000 full rotations. 15.000 to each direction respectively 15.000 turns back to the same position (turning cycles)

Thereof are:

- 20 % at Ta = 85 °C
- 30 % at Ta = 65 °C
- 50 % at Ta = 50 °C

4.10. Relays

4.10.1. Requirement on Clock Relay

- 250,000 switching cycles 230 V (400 V) / 10 A / T 105 °C

All tact- relays must be usable for a maximum load of 10 A.

4.10.2. Requirement on Pole Disconnection Relays

- 20,000 switching cycles 250 V (400 V) / 16 A / T 105 °C

(Ω-mic) requirement for the pole disconnection relays

4.10.3. Relay Assignment

The assignment of the respective relays to the according cooking zone is given in the relevant type of drawing. Due to multi configuration capability a TC- type can contain several configurations.

4.11. Approval

The knob control is VDE and UL certified.

4.12. Accessory

- Spacer 969.305 or 969.105 (can be ordered from E.G.O. as component part)

Each system requires 7 spacers (3 for the interface board, 4 for the display unit).

Not included in delivery from E.G.O. are:

- pin connecting cable for connection between interface board and knob control unit
- 8 pin connecting cable for connection between interface board and display unit
- 4 pin LIN cable for connection between display unit and induction
- pin connecting cable for control of optional LEDs for lightning the knobs

4.13. Maintenance and Repair

The Knob Control K6 needs no periodical maintenance.

Note	• Only repair measurements allowed by E.G.O. may be performed by the customer. • Any work on unpacked PCBs must be carried out by trained personnel who know how to handle devices that are sensitive to electrostatic discharges (ESD). • Re-soldering PCBs or the replacement of single electronic components is generally not allowed.

5. Referenced Standards

5.1. Safety Standards

- DIN EN 60335-1 (VDE 0700-1):2020-08; EN 60335-1:2012+AC+A11+A13+A1+A2+A14:2019 EN 60335-1:2012/A15:2021
- IEC 60335-1:2010 IEC 60335-1:2010/AMD1:2013 IEC 60335-1:2010/AMD2:2016
- Household and similar electrical appliances - Safety - Part 1: General requirements
- DIN EN 60335-2-6 (VDE 0700-6):2021-02; EN 60335-2-6:2015+A1+A11:2020
- IEC 60335-2-6:2014 IEC 60335-2-6:2014/AMD1:2018
- Household and similar electrical appliances - Safety - Part 2- 6: Particular requirements for stationary cooking ranges hobs, ovens and similar appliances
- DIN EN 60730-1 (VDE 0631-1):2021-06; EN 60730-1:2016+A1:2019
- IEC 60730-1:2013 IEC 60730-1:2013/AMD1:2015 IEC 60730-1:2013/AMD2:2020
- Automatic electrical controls for household and similar use - Part 1: General requirements
- DIN EN IEC 60730-2-11 (VDE 0631-2-11):2021-05; EN IEC 60730-2-11:2020
- IEC 60730-2-11:2019
- Automatic electrical controls for household and similar use - Part 2- 11: Particular requirements for energy regulators

5.2. EMC

- EN 55014- 1
- Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
- EN 55014- 2
- Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard
- EN 61000- 3- 2
- Electromagnetic compatibility (EMC) - Part 3- 2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
- EN 61000- 3- 12
- Electromagnetic compatibility (EMC) – Part 3- 12: Limits – Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase
- EN 61000- 3- 3
- Electromagnetic compatibility (EMC) – Part 3- 3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low- voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
- EN 61000- 3- 11

Electromagnetic compatibility (EMC) – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems – Equipment with rated current ≤ 75 A and subject to conditional connection

5.3. Usability

- EN 60350
  Household electric cooking appliances - Part 2: Hobs - Methods for measuring performance

5.4. Transport

Testing according to our special test protocol, variable testing procedures depending on intended transport routes:

- Pre-conditioning and test climate acc. ASTM D4332
- Vertical vibration testing: Truck transport test, broadband vibrating simulation acc. ASTM D4169
- Repetitive shock test: Simulation of potholes, road roughnesses, shocks during loading and unloading etc. acc. DIN EN 60068-2-27 (02/10)
- Horizontal impact test: Limited impact; truck brake application and fork lift transport acc. ASTM D5277
- Horizontal inclined impact test: Inclined impact test acc. ASTM D880
- Tilting fall to the ground surface: Rotational flat drop test acc. ASTM D6179
- High altitude test: Low pressure test acc. ASTM D6653

There are no approved power spectral density levels for sea transport. Therefore, the pre- and post-transport by truck or plane is simulated in priority.

5.5. Environment

Our products are reviewed/checked according to the standard:

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

Our products are compliant according the following EU directives:

- 2011/65/EC
  EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
- (EC) No 1907/2006

Regulation concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

6. Mounting

With the assembly the customer takes 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.

6.1. Installation conditions

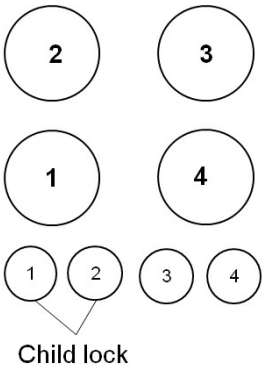
The PCB is fixed by means of 4 holes with nominal diameter 3.9 mm tolerance +0.1 mm. The assembly can be fixed at the installation location using commercially available spacers (EGO purchase part no. 969.305). A housing is not defined by EGO. The mounting via the PCB outer edges is not provided for tolerance reasons. The cable outlet direction of the attachable PCB edge connectors all point in the direction of the "non-assembled PCB side".

6.2. Allocation of the knobs

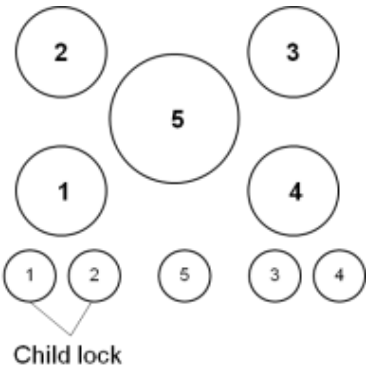
The interface board transfers the rotation angle of the knobs to the display unit which is the LIN-master of the entire cooking system. The master translates the rotation angle into power levels or the request of a special function. The position of the knob is coded through the position of the plug connection on the interface board.

Note	• A malfunction is possible if any connector is not fixed proper to the interface board during final assembly or through a service. • If knob connectors are swapped, the correlation from knob to cooking zone can be wrong. If the LIN connector is wrongly as a result no cooking zone can be used fixed to the interface board. • E.G.O. advises to use coded connectors. If those are used no permanent damage of electronic components can be caused. • After connecting all connectors, a functional check must be carried out.

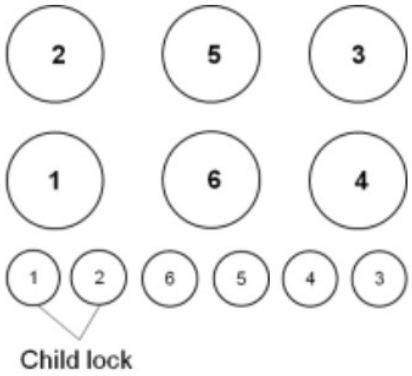
4-burner



5-burner



6-burner



7. Attachment

7.1. Allocation of Knobs to the Cooking Zones

The interface board transfers the rotation angle of the knobs to the display unit which is the LIN-master of the entire cooking system. The master translates the rotation angle into power levels or the request of a special function. The position of the knob is coded through the position of the plug connection on the interface board.

Remark: A malfunction is possible if any connector is not fixed proper to the interface board during final assembly or through a service. If knob connectors are swapped, the correlation from knob to cooking zone can be wrong. If the LIN connector is wrongly as a result no cooking zone can be used fixed to the interface board. E.G.O. advises to use coded connectors. If those are used no permanent damage of electronic components can be caused. After connecting all connectors, a functional check must be carried out.

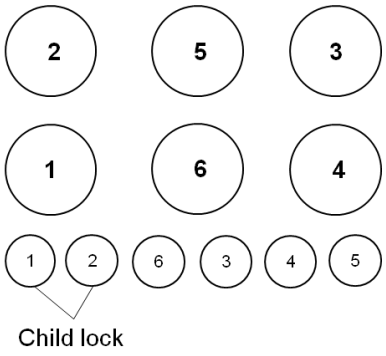


Figure 16: Allocation of knobs/cooking zones on a 4-burner hob

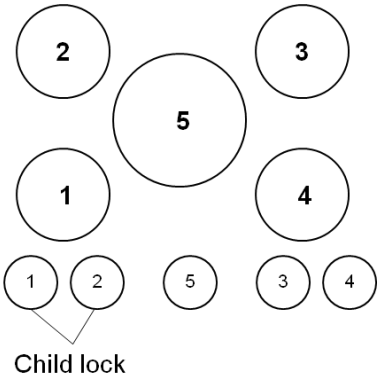


Figure 17: Allocation of knobs/cooking zones on a 5-burner hob

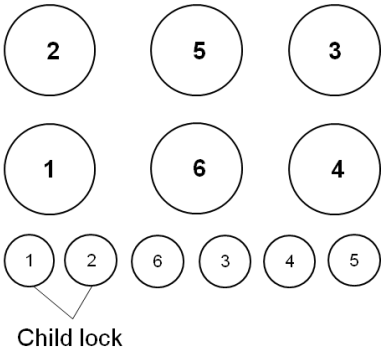


Figure 18: Allocation of knobs/cooking zones on a 6-burner hob