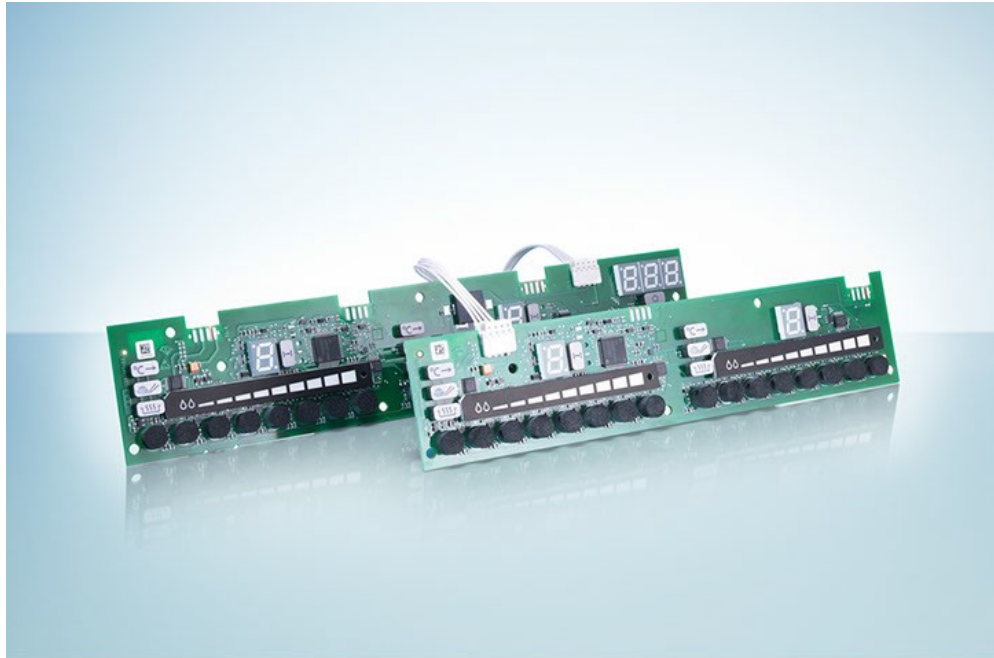

title:	EGO Flex TC customer documentation Flex TC	document-no.:	90.60060.349
editor:	METSCHN / 2023-12-13	sheet-no.:	101
released by:	WAECHTEB / 2023-12-13	version:	13
		state:	released

Functional Description of EGO Flex TC

Types: 75.13106.xxx, 75.13206.xxx



Change history

Responsible (EKP)	Date	Change
D. Selimic	05 th April 16	Initial release
C. Chmielewski	21 st November 16	Warming temperatures updated (chapter 4.13)
C. Chmielewski	9 th October 17	Error code list updated (chapter 6)
C. Chmielewski	19 th December 17	Response times for buttons fixed (chapter 4.4) Description of pause function fixed (chapter 4.19) Description for blinking schemes fixed (chapter 6.1)
C. Chmielewski	11 th January 18	Memory function for multi-circuit statuses added (chapter 4.16)
C. Chmielewski	17 th January 18	Description of pause function fixed (chapter 4.19)
C. Chmielewski	11 th April 18	Indication for demo mode fixed (chapter 6.2)
C. Chmielewski	23 rd April 18	Description for permanent key activation improved (chapter 4.22)
D. Selimic	2018-11-07	Table of Power Levels/ Operation Time Limitation (chapter 4.23) updated; Timer dot flashing fixed (4.18)
D. Selimic	2018-11-21	RHE Hyper behavior added (ch.4.9)
D. Selimic	2019-10-28	Update: While the Child Lock is active, the On / Off button works, as well as Keylock and Recall (ch.4.15)
S. Kleinhans	2020-02-17	????
D. Selimic	2020-02-21	Maintenance and repair added
J. Kazmierczak	2023-06-05	Connectivity added
N. Metsch	2023-08-30	Induction Gx added Description of Subject to Change updated Overview Bar graph (ch. 4.5) updated
N. Metsch	2023-12-13	Types updated

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use only within E.G.O. - Group and its direct
customers!”**

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List of Abbreviation

LIN *Local Interconnect Network*

PCN *Product Change Notice*

RHE *Radiant Heating Element*

TC *Touch Control*

Subject to Change

E.G.O. reserves the right to changes which occur due to further technical development and are compatible as much as possible to the existing design. All customers will be informed via 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 Flex TC

EGO Flex TC designed to be used in cooking systems together with:

- Induction G5
- Induction Gx
- Induction Basic 4
- Matrix Induction
- Radiant Heater
- E-Gas

2. Design of the EGO Flex TC

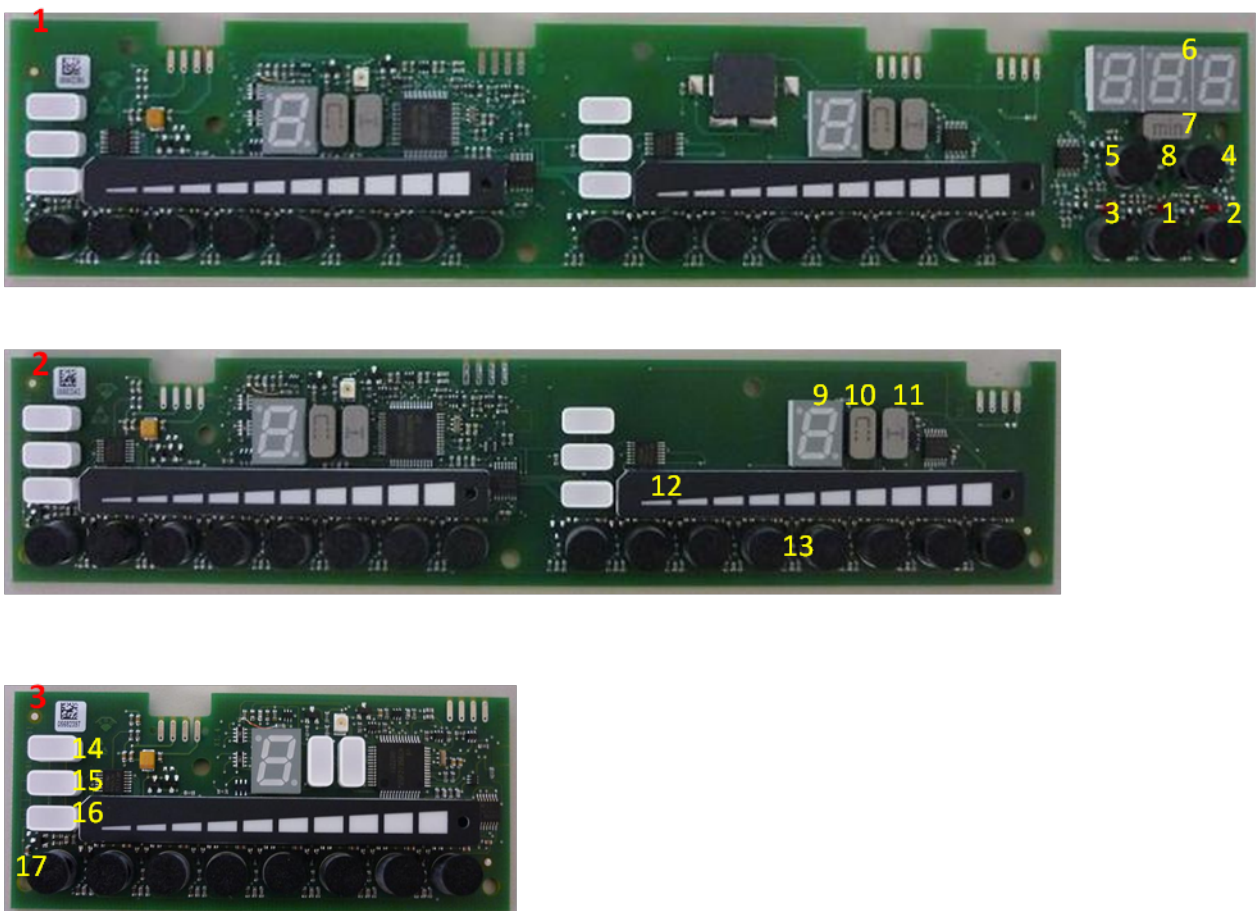


Figure 1: EGO Flex TC - PCB assembled

2.1. PCB Assignment

- 1- Master PCB for two cooking zones
- 2- Slave PCB for two cooking zones
- 3- Slave PCB for one cooking zone

2.2. Display and Key Assignment

- | | |
|--|--|
| (1) ON / OFF key with optional LED | (2) Special function key 1 with LED |
| (3) Special function key 2 with LED | (4) Timer key 2 |
| (5) Timer key 1 | (6) Three-digit timer display |
| (7) Timer luminous cap 1 | (8) Timer luminous cap 2 |
| (9) Multi-functional display per cooking zone | (10) Cooking zone related luminous cap 1 |
| (11) Cooking zone related luminous cap 2 | (12) Cooking zone related bar graph |
| (13) Cooking zone related slider | (14)– (16) Cooking zone related special function |
| (17) Cooking zone related select key for special functions | |

3. Functionality of the EGO Flex TC

Flex TC offers one slider operate area for each cooking zone in the system (up to 6 slider areas) in combination with the flexibility of a modular system. The illumination (bar graph; lased covers) and various options for special functionality are included as well. The TC platform product range offers different combination possibilities between Flex TC elements:

- 1- Master for two cooking zones (including the timer)
- 2- Slave for two cooking zones
- 3- Slave for one cooking zone

Based on the system layout and different configuration possibilities many different designs can be realised.

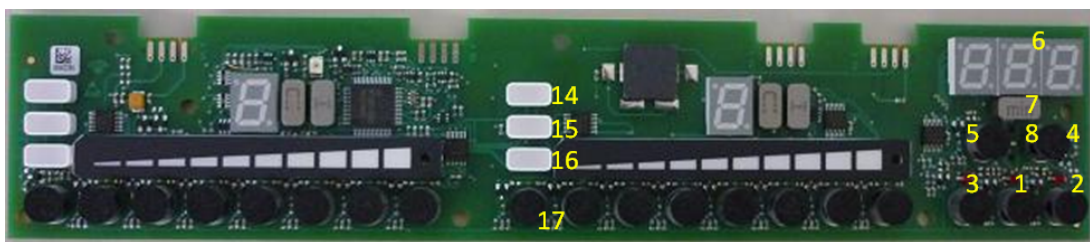


Figure 2: Special function keys and cooking zone related special functions

Special function keys 2 & 3: Those special function keys are designed for functions of the whole cooking system. The different TC functions as pause, key lock or recall can be implemented with keys number 2 & 3.

Cooking zone related special functions 17: Various special functions are related to the cooking zone. Those can be activated by using the cooking zone related special function key and can be selected by toggling (warming, boiling, melting, simmering, roast function...).

Indication:

- Selected luminous symbols can be generally displayed half and then fully illuminated
- Luminous symbols are dark and fully illuminated when selected.

4. Functions

4.1. Power Levels

A total of 9 different power levels (1-9) with optional booster level are offered for each cooking zone. The effective cooking level is indicated by the associated 7-segment display as well as by an optional illuminated bar graph during active phase.

4.2. TC Switching ON/OFF

The TC switches **on** by pressing the ON/OFF key. Variants with 7-segment displays show a static [0] then. [0] and [H] are displayed alternately if a cooking zone is hot remained by previous cooking processes.

The electronic will be active for 10 sec after switching on. If no cooking zone or timer is selected within this time the TC automatically returns to the standby mode with an acoustic buzzer signal. The TC can be activated only if the ON/OFF and none of the other keys is pressed. The TC can be switched off by pressing the ON/OFF key in active mode at any time.

The TC switches from power on to power off after 10 sec if no cooking zone or timer as well cooking zone special key is pressed during that time.

Induction systems: After connecting the system to the mains power supply the system takes 2.5 sec (except Induction Gx: < 1 sec) to be ready for use. It depends on the time the induction module needs to power up the TC and works if the induction is already configured. If the induction is not configured additional 3 sec are required for the configuration (configuration via LIN: 8 sec).

4.3. Cooking Zone Switching ON/OFF

If the TC is already switched on, a cooking zone and cooking level can be selected by touching on the cooking zone slider area. The cooking level can be increased or decreased by finger "sliding" on the slider area. This is displayed on the bar graph according to the finger position. Additionally, the cooking zone level is displayed on 7-segment display.

A single cooking zone can be switched off by selecting the lowest cooking level (0) on the slider area directly or by sliding to the lowest cooking level. The according display shows "H" if a still hot cooking zone is switched off.

It is always possible to switch off all cooking zones immediately by using the ON/OFF key. All cooking zones still "hot" indicate [H] on the corresponding 7-segment display.

4.4. Response Time of Sensor Keys

The response times of the sensor keys are defined as follows:

Key	Delay for OFF	Delay for Power ON
ON/OFF key	approx. 0.35 sec	0.35 sec
Slider keys	approx. 0.35 sec	0.35 sec
Special function keys	approx. 0.35 sec	0.35 sec
Dual circuit/timer keys	approx. 0.35 sec	0.35 sec

Figure 3: Table of sensor keys response times

The tolerance of the response times is +/- 0.1 sec.

4.5. Bar graph

Different standard designs for bar graph are available. These allow a customization and differentiation.

Currently, the following bar graphs are available:

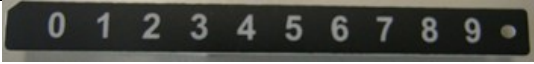



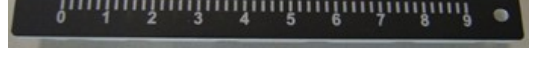

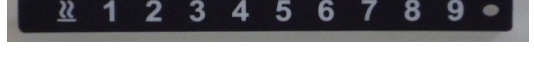
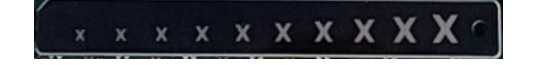
Bar graph light guide image	EGO Number
	00075.183.91
	00075.183.92
	00075.183.93
	00075.183.94
	00075.183.95
	00075.183.96
	00075.183.97
	00075.193.81

Figure 4: Different bar graph light guide designs

4.6. Toggle Function

Toggle functionality is optional and makes it possible to select between different functionality by using the same key. The special function key and three LEDs can be used to enable “special functions” to a selected cooking zone. Depending on the configuration different functions are possible. The LEDs indicate the possible settings.

The following sequences are to be observed if **three functions are possible**:

- All 3 LEDs are illuminated with reduced brightness
- 1st key action: 1st LED gets full brightness
- 2nd key action: 1st and 2nd LED get full brightness
- 3rd key action: all LED get full brightness
- 4th key action: all LED got reduced brightness and the cooking level is set to 0

The following sequences are to be observed if **two functions are possible**:

- The first 2 LEDs are illuminated with reduced brightness; the 3rd LED is off and stays off
- 1st key action: 1st LED gets full brightness
- 2nd key action: 1st and 2nd LED get full brightness
- 3rd key action: all LED got reduced brightness and the cooking level is set to 0

The following sequences are to be observed if **one function is possible**:

- The first LED is illuminated with reduced brightness; the 2nd and 3rd LEDs are off and stay off
- 1st key action: 1st LED gets full brightness
- 2nd key action: all LED got reduced brightness and the cooking level is set to 0

If a cooking zone is selected the select key (17) will toggle through the levels / states of the special functions.

The LEDs are illuminated according to the selected state.

If the special function is at the highest state gradation the next key action will deactivate the function. The “induction 3-level-low-temp-function” is currently implemented.

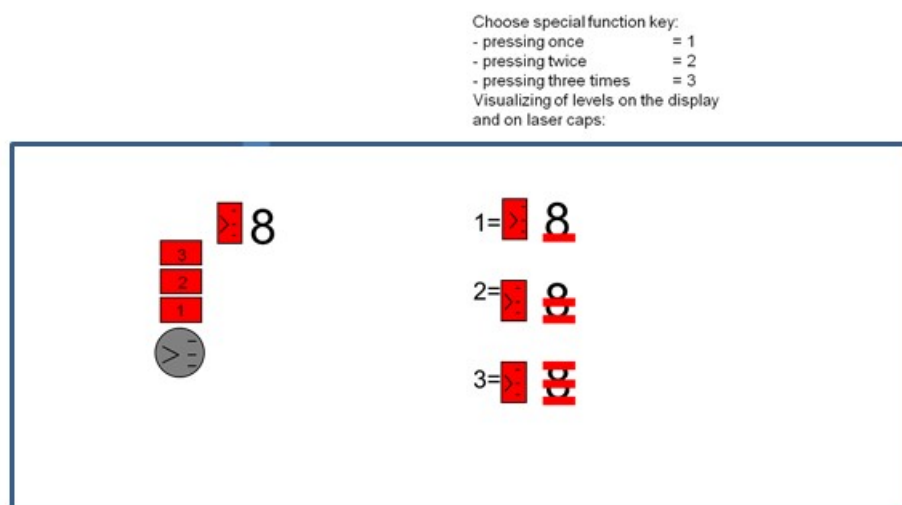
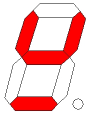


Figure 5: Illustration of toggle functionality on 7-segment display

4.7. Pot Detection



The pot detection function is active after activating the cooking zone and at cooking level value greater 0. It requires max 2.5 sec to check if cookware is placed on cooking zone or not.

Figure 6: Indication of “missing pot” on 7-segment display

In case of no cookware is identified by the system a “missing pot”- Figure 6 is indicated alternating with cooking level setting on the display.

4.7.1. Permanent pot detection (as option)

Permanent pot detection is available with Induction G5 and Induction Gx. The permanent pot detection allows end customers an intuitive usage of induction cooktops. The function that can be activated in the TC recognizes active cooking zones in the system. Only active cooking zones are illuminated on the TC. Cooking zones not actively used are not illuminated. Changes on the cooking appliances as placing a new cookware on the cooktop is recognized automatically via a continuous controlling of the pot detection signals and monitored on the TC.

4.8. Power Management

The power management protects the phases against overload. The total power and therefore also the total current of all inverter are limited and operated to a configurable maximum value on one phase.

The TC sends the requested power level to the induction generator. If this power level is too high the induction module decreases the coil “current power” connected to the same phase. The remaining power for the phase is sent depending on the current configuration. The TC looks for the next lower power level fit to the received power and set this power level active for the cooking zone. Indication follows by the flashing cooking zone level for 3 sec. The level is changed after this time. If the remaining level is too low for operating the cooking zone is switched off.

The maximal permissible power per induction module is 3.7 kW. One module supplies two cooking zones, i.e. the sum of both cooking zone power levels may not exceed 3.7 kW. If the user activates the booster and the level of remaining power is not enough for booster mode - the user operation is accepted because the last operation has priority. The previously set cooking level hence must be limited in order not to exceed the total power of 3.7 kW. The limitation is indicated to the user with a blinking cooking level of the cooking zone to be reduced. If a power level is set within the correction time of 3 sec that does no longer require a reduction and the blinking ends. When the correction time passes the reduced cooking level is active and statically displayed.

The new value results from the difference of 3.7 kW and the new requested boost power. The induction module transmits the maximal possible remaining power via LIN. The next possible lower level is selected if the TC detects value between two possible power levels.

After the end of the boost operation, a previous reduction of a cooking zone due to power management is not cancelled automatically. For this purpose, the power level of the relevant cooking zone must be changed manually by the user. The induction evaluates the last entry of the user with the highest priority. If for example the user activates the booster function for two cooking zones from the same power board the last activated booster is activated while the first selected booster is no longer applicable. This cooking zone will be reduced as described above. The same procedure is executed when, for example, a previously activated heat up time automatic must be disabled because of a new activated booster or heat up time automatic on another cooking zone. If remaining power level is sufficient to keep the previously set simmer level only the heat up time automation is disabled, and the simmer level is selected. If the remaining power is too low the cooking level is reduced to the maximum possible.

With an Induction G5 and an Induction Gx system it is also possible to configure a "virtual power management" which allows the user to select power value temporary and virtually for a limited range exceeding 3.7 kW. Further details on this feature can be taken from specification of Induction G5 and Induction Gx. When specifically requested, virtual power remains inactive. Like the previous power management this feature works passively in the background and requires no further specifications, display or operation settings.

4.9. Overheating Protection

The induction works inherently safe i.e. the TC sends instructions regarding the power levels requested. The induction reports the actual cooking levels and depending on the internal system state the appropriate cooking levels can be applied. The induction cooking zones have temperature sensors for temperature controlling below the glass-ceramic panel. The temperature sensors on the heat sink protect the electronic from overheating additionally.

- When exceeding a first, minimum temperature limit this will be reported via LIN and the induction deactivates a possibly operating booster. The TC accepts this request and deactivates the booster by setting the remaining operating time to 3 sec. After 3 sec the TC changes from "P" to "9" or the reduced maximum possible power level.
- When exceeding a second, medium temperature limit the induction reduces the power output to prevent a further rise in temperature. The TC receives the information about power-reduction in operation via LIN. The TC still shows the unchanged user settings.
- If the temperature of a cooking zone exceeds a third, maximum temperature limit the induction switches cooking zone automatically off. The induction transmits the information "switching off due to overheating" via LIN. The concerned cooking zone is switched off by the TC. The corresponding display indicates a flashing error code [E2] possibly alternating with [H].

Remark: As overheating protection in the case that Hyper heater is switched on, the reduction takes place on the power board and the reduced power level is not displayed. Hyper heater is not switched off but is clocked.

4.10. Boost Function

Boost function is an option for induction cooking zones and is indicated by Figure 7.



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

A significantly above nominal level higher power in boost mode offers an additional high cooking level for a limited time. The booster function allows the user to heat the cookware very quickly and saves the time.

Optionally depend and fixed per variant the boost function can be activated as follows:

- On the slider (on the right the value 9)
- After selection the according cooking zone by using the slider / as power end level on the slider

By activating of boost level, a possibly active heat-up time automatic is canceled and the power level is set to the highest possible level. In order to make sure that nominal power will be applied after boost deactivation. If the key for boost activation is pressed [P] will be displayed. [P] flashes for 3 sec and the booster function is deactivated if is not possible to activate the boost function i.e. in case of over temperature.

The boost function can be activated for a limited time for each cooking zone (Induction Basic 4: 5 min, Induction G5: 10 min, Induction Gx: 15 min, Induction Matrix: 8 min). If the pot is removed from the cooking position while the booster function is active, the booster is not deactivated, but the booster time limitation counter keeps running. The boost function can be reactivated after expiration of boost time as long as the temperature conditions it allows. In order to visualize the deactivation of the booster the cooking zone display shows a flashing [P] for 3 sec before deactivation. Generally, any reduction of the cooking level deactivates booster function.

4.11. Heat-up Automatic (Selectable)

Active heat up time automatic can be activated for any cooking level from 0 to 9 but not for special functions like boost or warming function and is indicated by Figure 8. The cooking zone level is set to the highest value (100%) for a period time depending on selected continuous cooking level.



Figure 8: Indication of heat up automatic on 7-segment display

Heat up automatic activation: The required continuous cooking level is chosen and kept for 2.5 sec. The activated heat up automatic is displayed alternating between [A] and selected continuous cooking level on the 7-segment display. As soon as the heat up time is over the preselected continuous cooking level is valid again.

Operating sequence:

- For the according cooking zone is displayed [A] for heat up automatic alternately with the continuous cooking level value. The two symbols flash according schematic 1 (see 6.1).
- If the heat up time automatic is activated for a cooking zone with pot detection (always applies for induction) and no pot is detected, [A] flashes alternating with “missing pot” symbol.
- If another cooking level is selected the heat up time automatic is deactivated as well as a cooking level is activated by press a slider for more than 2.5 sec.
- If a cooking zone is switched off while the heat up time automatic is active this function will also be deactivated.
- If the heat up automatic time has expired or the function is deactivated through user inputs the display shows the selected continued cooking setting and the flashing alternate with [A] will stop.

Special characteristics of the heat up time automatic for inductive cooking systems:

- The activated heat up automatic may lead to reducing the cooking level of another cooking zone.
- Generally, an active booster and heat up automatic are possible at all cooking zones but not at the same time. The booster is terminated under circumstances if the heat up automatic activation is required and reverse- if the heat up automatic is active and the booster is selected the heat up automatic is switched off immediately.

4.12. Bridge Function (Optional)

With the bridge function two separate cooking elements /inductors with the **same diameter** and **equal power** can be switched on at the same time and controlled as one cooking zone only. One of the two bridged cooking zones is the “slave” and the other is the “master” cooking zone.



**Figure 9: Indication of bridge function
“master” and “slave” cooking zones on 7-segment display**

- The total of the standard outputs-must be possible together ($\leq 3.7 \text{ kW}$ / $\leq 4.2 \text{ kW}$ in virtual power mode).
- The boost mode is not possible if bridge function is activated.

- The both bridged zones must be placed next to each other on the TC.

The both connected inductors work in the generator completely independent of each other: the power control, cookware detection or temperature monitoring of both zones work in the generator separately. The bridged cooking zones maintain from the TC only the same power level value. The function is activated or deactivated by selecting the both cooking elements simultaneously. The bridge function is activated by pressing and holding one of the front zones (master) slider keys and one of the rear zone (slave) slider keys simultaneously for approximately 2 sec. Once bridged the both zones may be switched on/off by either key. However, a setting of power level is only possible by the left slider (master) of the two bridges zones as standard for Flex TC.

Cookware detection is done independently for the two zones and displayed on the TC. If no cookware is detected on the master zone a “missing pot” is displayed. If no cookware is detected on the slave zone a “missing pot” is displayed alternating with symbol for “slave”- Figure 9. If the cookware is detected only on the “slave” zone but not on the “master” zone, the symbol for “slave”- Figure 9 is displayed alternating with the cooking level 9 on the “slave” display.

An uncovered cooking zone must be switched off after 10 minutes at the latest to meet the requirements of the safety standard. The bridge function is automatically deactivated if no cookware is detected on one cooking zone in 10 minutes uninterrupted. If the permanent pot detection is active on the Induction Gx, the bridge is automatically deactivated after 20 seconds in case that no pot is detected. The uncovered cooking element is switched off and the covered cooking element remains as the single cooking element switched on with the cooking level set. The bridge function can be deactivated by repeating the simultaneous selection of both cooking elements same as activation. Deactivation is also done by TC switching off using the ON/OFF or by the TC automatic switching off.

Possibly existing settings (cooking level, booster and timer) are deleted and set to “0” by activating or deactivating the bridge function. A timer can only be assigned to the bridged “master” zone, thus not for the “slave” zone. The temperatures of both bridged zones are controlled individually if a warming function is activated.

4.12.1. Semi-automatic bridge function

If a cookware covers the two octal coils the TC shows the bridge symbol. Afterwards the confirmation is needed to activate the bridge function.

4.13. Warming Function

This function is used to keep cooked food warm.

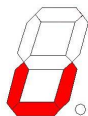


Figure 10: Indication of warming function on 7-segment display

4.13.1. RHE

The selected cooking zone is operated with a consistent low power output. The active warming function is displayed on Figure 10.

To activate this function a cooking zone must be selected. The warming function could be activated as a special function via key 3. For some variants the function is integrated in the slider between cooking level 0 and 1. Activating of the pause function interrupts the warming function.

The warming function for RHE is set to 2.5 % of duty cycle time.

4.13.2. Induction G5 and Induction Gx

The warming function at G5 and Gx Induction is temperature controlled and currently available in three steps. The power is automatically adjusted. To activate this function a cooking zone has to be selected. Afterwards the special function key has to be pressed. By pressing once, the first warming level is selected. By pressing twice the second level is selected and by pressing three times - the third warming level is selected - see also chapter 4.6 Toggle function.




Level	Symbol	Description	Temperature G5	Temperature Gx
Level 1		“Melting“	42 °C (Variants specified before 2016-12) 44 °C (Variants specified after 2016-12)	44 °C
Level 2		“Warming“	70 °C	70 °C
Level 3		“Simmer“	94 °C	94 °C

Figure 11: Indication of warming levels on 7-segment display

4.13.3. Time limitation of the keep warm function

In order to assure the food quality and for microbiological reasons the warm keeping time shall be as short as possible. The time limit for this function is two hours (except Induction Basic 4: 6 h). TC switches automatically for this reason in stand-by mode after this time.

4.14. Residual Heat

The glass temperature of each cooking zone is calculated by a mathematical model and displayed by [H] from "HOT"-Figure 12 on the corresponding 7-segment-display.



Figure 12: Indication of residual heat on 7-segment display

After the power levels turning off, the residual heat on a cooking element is displayed as long as the temperature is over 65°C (default value). This temperature is still high enough to cause injury.

For **radiant heater** the state is calculated by the power unit depending on the cooking level. If the relay is on, the counter counts (heating). The counter counts down if the relay is off (cooling). If the counter is above a certain limit the cooking zone is hot.

Typical values for a radiant heater:

- About 8 sec at level 9 set the HOT state for 7 min (the zone is switched off after 8 sec)
- About 1 min at level 9 set the HOT state for 32 min (if the zone is switched off after 1 min)
- About 13 min at level 9 set the HOT state for 58 min (if the zone is switched off after 13 min)

In systems **Induction G5 and Gx**, the coil temperature is measured by temperature sensors directly on the cooking zones. The value is evaluated, and the result is sending on the LIN bus as hot or cold.

4.15. Child / Key-Lock Function

The keys could be locked to suppress unintended actions and as protection of children.



Figure 13: Indication of lock function on 7-segment display

4.15.1. Activation of Child-lock function

The child-lock may be activated after TC switching on. The TC indicates the "Lock" status with [L] displaying on the 7-segment display - Figure 13. If a cooking zone is still "hot" [L] and [H] blink alternately. One of the following child- lock activation options can be implemented:

- Press key number 2 and number 3 simultaneously, and then press key 3 again.
- Press key with number 2 and number 3 simultaneously and hold them for at least 3 seconds.

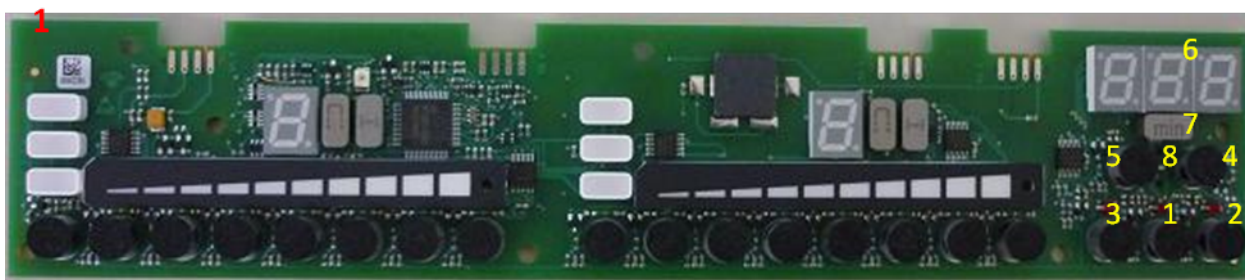


Figure 14: Flex TC Master PCB with special function keys 2 and 3 for child-lock activation

Uncompleted inputs are cancelled without effect on cooktop condition. The child-lock deactivates all keys / functions except the ON/OFF, Key-lock and Recall. Once activated electronic stays locked even if the TC is switched off and on again.

4.15.2. Deactivation of Child-lock function

After TC switching on the child lock can be deactivated. Deactivation options are:

- Press key with number 2 and 3 simultaneously. Thereafter the key number 2 must be pressed again within 3 sec.
- Press key 2 and 3 simultaneously and hold them for 3 sec for child- lock deactivation completely.
- **One-time unlocking (for one cooking event):** Pressing special function keys 2 and 3 simultaneously deactivates the child-lock for the actual cooking session. After switching off the child-lock is reactive and hence active when switched on again.

Uncompleted inputs are cancelled without effect and the child lock stays active. If the child lock is deactivated successfully the TC is in standby mode. Otherwise the entry is as not completely interpreted. The TC remains locked and switches automatically off after 10 sec. Further attempts to unlock TC are possible within 10 sec.

4.15.3. Key-lock function

By actuating the key lock key in wait or active mode all keys are locked and according to E.G.O. standard key- lock is indicated by LED above the key. The TC works in mode set before key lock activation. Only the key lock key and ON/OFF key is possible to operate now. TC switching off by ON/OFF key is still possible in locked mode. By renewed key lock key actuating in wait or active mode the TC is unlocked again. The key lock indication disappears, and all user inputs can be handled further.

4.16. Multi-Circuit (RHE)

The TC can, depending on the variant, actuate dual- and triple circuits at radiant heating elements (RHEs). The switching statuses of the multi circuits are stored when the cooking zone is turned OFF and will be recovered if the cooking zone will be turned ON again. The default status (if the power supply for the TC has

been interrupted) for all multi-circuits is OFF. The maximum number of relays is limited to 6, due to the used power board. The configuration (single-, double-, triple circuit) could be set for each cooking zone. The assigned relays could be configured.

4.16.1. Activation / deactivation of dual-circuit RHEs

By multi-circuit key pressing (special function key- no. 2) the outer/second circuit of the active cooking zone is switched off. By pressing the multi-circuit key again, the outer/second circuit of an active cooking zone can be switched on again. An active outer/second circuit is indicated by an additional LED.

All assigned relays are switched on at the same time if on-phase of the duty cycle is reached. If the off-phase of the duty cycle is reached the assigned relays are delayed switched off by 0.3 sec (switching order: double zone relay – inner relay).

4.16.2. Activation / deactivation of triple-circuit RHEs

The following operating sequence is providing for the control of triple- circuit RHEs:

- The outer circuit of corresponding active cooking zone can be switched off at any time by actuation of multi -circuit key (special function key no. 2)
- By the renewed actuating of multi- circuit key is outer circuit switched on again and the assigned LED lights up
- By the second actuating of multi- circuit key is the outer triple circuit including LED active in operating again

All assigned relays are switched on at the same time if on-phase of the duty cycle is reached. If the off-phase of the duty cycle is reached, the assigned relays are delayed switched off by 0.6 sec (switching order: triple zone relay – double zone relay – inner relay) but switched on synchronously.

4.16.3. Temperature regulation

Different temperatures could be realized by a specific relation between ON and OFF phase, depending on the current cooking level. If higher the level the ON phase is longer. The assignment is defined in the power level tables. A relay is on during the ON phase. It is realized always with 100% of the nominal power.

4.17. Buzzer

A buzzer can be used to give acoustic feedback to the user. The following actions are indicated by buzzer:

Keys acknowledgment- a short single tone in the duration of 0.04 sec at regular keys pressing

All error variants - a single tone in the duration of 0.1 sec

Timer alarm

Permanent key actuation and wrong connection U400 - permanent tone if the respective condition exists, ends after a maximum of 2 minutes.

4.18. Timer

The timer function is available in two basic variants:

- Cooking zone timer

- Stand-alone timer / egg timer

The maximum number of timers is 7. One timer is available for each cooking zone (max. 6) and one for stand-alone / egg timer. The timers can be used parallel. The TC has to be switched on before activating a timer. Switching the TC off deactivates cooking zone related timers. The egg timer stays active after switching the TC off. The three 7-segment displays (6) show the remaining time until the alarm is activated. All timers work as count down timers. The operation range is between 1 min - 1h 59 min. Beneath 10 min is timer displaying accurate to the second. The dot behind first digit flashes as soon as a timer is active.

Time interval	Timer display
0 - 09 sec	0.09
10 sec - 59 sec	0.59
1 min - 9 min 59 sec	9.59
1 min - 59 min	0.59
1 h - 1.59 h	1.59

Figure 15: Timer range and display

In order to assure clear assignment of the actual displayed remaining time to a cooking zone each cooking zone has a luminous symbol fully lighted when the timer for this cooking zone is displayed in the 3 digit 7-segment display. This symbol is inactive if the cooking zones timer is inactive. If a cooking zone timer is active but not displayed on the 3 digit 7-segment display the luminous symbol is not fully illuminated (dimmed). Alternatively, this differentiation can also be realised using flashing or static luminous symbols.

4.18.1. Cooking zone timer

A cooking zone timer can be set for each active cooking zone. By simultaneously pressing the two timer keys is the timer selected and can be switched further. Thereby are all active cooking zones and the egg timer considered in clockwise direction when switching.

After selecting the timer, the cooking zone related luminous symbol is fully lighted and the timer display shows "0.00". For the following 4-5 sec it is possible to assign a timer value to the active cooking zone. After this time without input the timer function is deactivate and the display is switched off again. Using the timer selection key again, if no value was set, the next active cooking zone can be selected.

Setting a timer value: A timer value can be set and modified at any time by pressing the timer keys. If the timer plus key is pressed first the display starts with

- 1 min and can be increased in 1 min steps up to the next full 10 min
- up to the next full hour, it is done in 5 min steps
- from there on, the sequence is done in 10 min steps

Pressing the key permanently fastens the timer adjustment up. The time between two steps reduces and the speed increases while the key is held.

Timer expiration / alarm / acknowledgement:

- The timer alarm is activated, and the assigned cooking zone is immediately switched off if a timer expires. The cooking zone display shows [0] or [H] for hot surface indication
- If not stopped by user input the alarm signal is audible for maximum 2 minutes and then deactivated automatically
- The alarm can be deactivated by the TC switching off using the ON/OFF key or by pressing the two timer keys
- To stop an active timer the value can be set "0". Pressing the timer keys for 2 seconds also resets the timer value to "0.00"
- In order to prevent an unwanted clearing the timer is reset after a short delay time- see 4.4.

The stand-alone timer selection is the same as the cooking zone selection time (2 sec). Each key action on the timer will retrigger the selection time. The timer is deselected if selection time expired.

4.19. Pause Function

During active **pause** function, no power is emitted, and cooking process is interrupted. For the identification of pause function can be used any desired special function key with related LED.

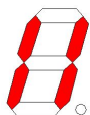


Figure 16: Indication of pause function on 7-segment display

Activating the pause function: The heating elements may be switched off by actuating the assigned special key for 0.3 s (see chapter 4.4) when at least one cooking zone is in operation. An active pause is displayed on Figure 16. To deactivate pause function the special function key has to be pressed again. The pause condition may also be activated with cooking zone-specific errors. The error is displayed alternately. The residual heat indication, special messages such as [A], [P] or “missing pot” is concealed because the pause displaying has priority. General errors prevent to switch off the TC and thus the activation of the pause beforehand. If general error occurs during the pause, the TC switches off and terminates the mode.

While the pause function is active: While the pause function is active no power is emitted on any cooking zone. All system settings are maintained throughout the pause. After the pause the timeout counters are restarted even if they were partly run down before, in a case the pots are not detected on cooking zone. Any timer set before and stopped during the pause continues when pause mode is over. When the pause mode is activated a selected heat-up time automatic is terminated. Residual heat calculation and maximum operation time limitations are not interrupted and keep on working in the background. Optional or functional LEDs such as timer, multi-zone... keep on glowing according to their status.

The pause mode can only be active for maximum of 10 min. If the pause mode is not deactivated within 10 min the TC switches off automatically. Throughout the pause time the ON/OFF button can be used to switch the TC off. In this case the pause mode is also deactivated.

Deactivating: The pause mode is deactivated by actuating the pause key and by slider operating within 10 s. This means slide from low to high level or from left to right. After pressing the pause key the displays of the according cooking zone slider start flashing. By sliding the display flashing will disappear - the display is fading according to the sliding position. The status before the pause is activated. The pause function stays active if the pause function is not deactivated by slider within 10 s.

4.20. Recall Function

The recall function enables settings to be recovered quickly when the TC has been accidentally switched off by the mains switch. After switching off the user has 6 s to switch the TC on again. The additional 6 s are available to press the pause key in order to recall the settings. The recall function can only be used if at least one cooking zone was active with cooking level higher than zero, independent from possible activities of key- or child lock. Activation of the recall function is confirmed by acoustic feedback.

Restorable information:

- Cooking levels of all cooking zones
- Minutes and seconds of active cooking zone related timers
- Working condition of multi-zones (done by memo-function for multi zones)
- Heat up time automatic and booster function
- Child-lock state

Non restorable information:



- Counter for operation time limitation (user intervention by switching off)
- Counter duty cycle (after switching on new cycle starts again)
- If the power reduction delay time is running at the time of switching off (power management) but the new cooking level has not been taken over yet, the recall cannot reconstruct the last setting of the user (to be realized with priority). This is possibly in the case during the 3 s of power reduction delay time.
- Since the induction module without power output cannot execute pot detection, the time counter for "missing pot" is started new after the pause mode. The respective cooking zone is deactivated latest after 10 min.

4.21. Automatic Switch off (Operation Time Limit)


A maximum operation time limit is defined depending on the chosen cooking level if a cooking level is not changed. If a maximum operating time is exceeded, the cooking zone is switched off and the residual heat is displayed (see 4.14) in case of hot surface. The remaining time until automatic switch off is reset to the defined operation time limitation for this cooking level after any user operation. The timer settings have priority over operating time limitation.

4.22. Protection against Permanent Key Activation

Flex TC has an integrated mechanism for the detection against permanent key activation. A permanent activation is detected if one key is activated for more than 10 s. The following behavior appears:

Permanent key activation of	Behaviour
a slider key	corresponding cooking zone is switched OFF,  is displayed and a permanent signal tone is emitted for 2 min.
a general function key on the TC's master	 is displayed and a short signal tone is emitted. The whole cooktop is turned OFF.

Notes:

- Water sprinkled on the glass surface does not always lead to activating a key and cannot be surely detected. After wiping the glass surface all keys are **immediately ready for use again**.
- The power ON/OFF key and single cooking zone select / off keys (17) has priority over any other key. Hence the TC can be switched off even if other keys are pressed or a permanent use of keys is detected.
- In case the cooking zone is still hot the letter [H] alternates with the error code symbol .

4.23. Table of Power / Heat up Automatic /Operation Time Limitation

Cooking level	Power [%]		Heat up Automatic [sec]		Operation time limit [min]
	RHE	IND	RHE	IND	
0	0	0	-	-	720
LowTemp.1	2.5	0.5	-	-	120 Induction Basic 4: 360
LowTemp.2	2.5	1	-	-	120 Induction Basic 4: 360
LowTemp.3	2.5	1.5	-	-	120 Induction Basic 4: 360
1	3	3	50	40	516
2	5	5	90	72	402
3	8	8	150	120	318
4	12	12	220	176	258
5	18	18	320	256	210
6	28	27	540	432	138
7	42	42	150	120	138
8	64	64	240	192	108
9	100	100	-	-	90
P	-	100+X	-	-	Induction Basic 4: 5 Induction G5: 10 Induction Gx: 15 Induction Matrix: 8

Figure 17: Power / HuA/ Operation time limitation table

5. Connectivity

Flex Touch Control is prepared for extended control or hob-to-hood communication by broadcasting via an additional BLE connector. The available feature list can be obtained on customer's request by E.G.O. For detailed information please have a look at the customer documentation of the BLE connector 90.60113.721.

6. Error Output and Management

E.G.O.'s platform concept provides dedicated error codes for a quick and efficient trouble shooting. An error code always starts with the letters "E" or "ER":

- Error codes starting with "E..." are included in the induction documentation.
- Error codes starting with "ER..." are included in the user interface documentation.

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 touch control errors		
Error code	Description	Remedy
 / H	Permanent use of keys; TC switches off after a certain period (see section 4.22)	Water or cooking utensils on the glass; Clean the surface
ER20	Internal error in touch control	Replace touch control
ER21	Over temperature	Let cooktop cool down Check heat partitioning for TC
ER22	Internal error in touch control	Replace touch control
ER31	Variant detection error	Download correct configuration
ER36	Internal error in touch control	Replace touch control
ER40	Power supply voltage too low on secondary side	Check connected components for overload Replace touch control
ER47	LIN communication error	Check LIN cabling Check connected LIN slaves
EA	Communication error	Check cabling between touch control and power board Replace touch control Replace power board
U400	Overvoltage due to wrong connection	Turn off power supply voltage and connect cooktop properly

Figure 18: General touch control errors

Cooking zone specific errors (Induction)		
Error code	Description	Remedy
E2	Over temperature of cooking zone	Allow cooking zone to cool down
E3	Inapplicable pot	Use suitable pot
E4	Cooking zone does not exist, configuration data is incompatible	Download correct configuration
E5, E6	Error on filter board/generator	Replace filter board / generator
E7	Unknown failure (master is not able to assign the failure code)	Contact E.G.O. technical support
E8	Fan defective	Replace fan
E9	Temperature sensor defective	Replace temperature sensor

Figure 19: Cooking zone specific errors (induction)

Cooking zone specific errors (radiant heating elements)		
Error code	Description	Remedy
E2	Over temperature of power board	Allow cooking zone to cool down
E4	Internal error on power board	Replace power board
E5, E8, EA	Relay error on power board	Replace power board

Figure 20: Cooking zone specific errors (radiant heating elements)

6.1. 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 msec.

6.2. Service Menu (for technician)

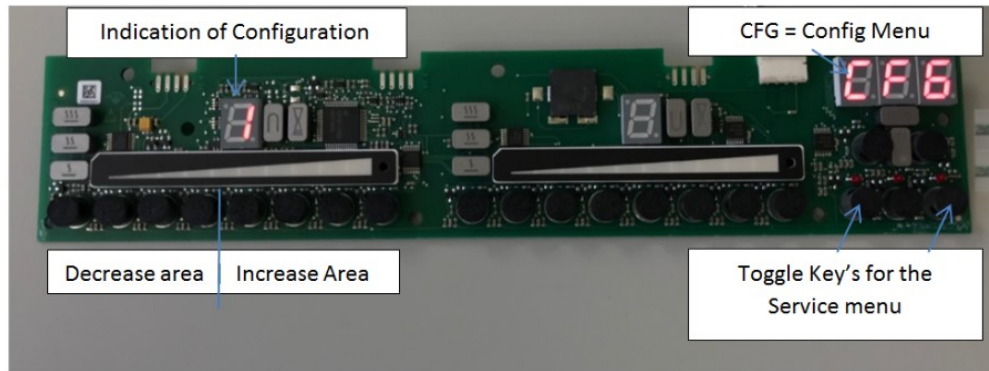
The service menu enables a service technician to get certain system information or to change configuration data without TC removing from the device. The main aspect is the possibility to choose a configuration variant for inductive systems or multi zone assignment for RHE. Optionally it is possible to read out the software version number (Format X.XX, e.g. V1.00).

6.2.1. Access to the service menu

In order to prevent accidental user access, the service menu can only be activated within the first 2 minutes after reset / line power connection. The TC must be in the off-mode and no timer has to be active. Access to the service menu is possible even if general or cooking zone relevant errors are present because changing settings in the service menu may clear those errors (e.g. error for wrong configuration).

- Both special function keys have to be pressed for 4 sec.
- A beep occurs
- Following the two sliders of the master TC have to be pressed for 4 sec. This activates the global service menu i.e. the actual status and the menu item are transmitted to all available slaves via LIN.
- A beep occurs again

A separated activation of the service menu on a slave TC is not necessary and not possible. Navigation through the menu is possible by pressing the special function keys of the master (Ch. 2 / Special function key 2 and 3 or Toggle key). The first menu item which is selected when entering the menu is the configuration setup. The timer displays show [CF6] for "ConFiGuration".



Using the left slider of each TC-HW the required configuration can be selected. The according display shows the actually selected configuration number. Touching the according slider in the left half allows the user to decrease the value. Touching the slider on the right half increases the value.

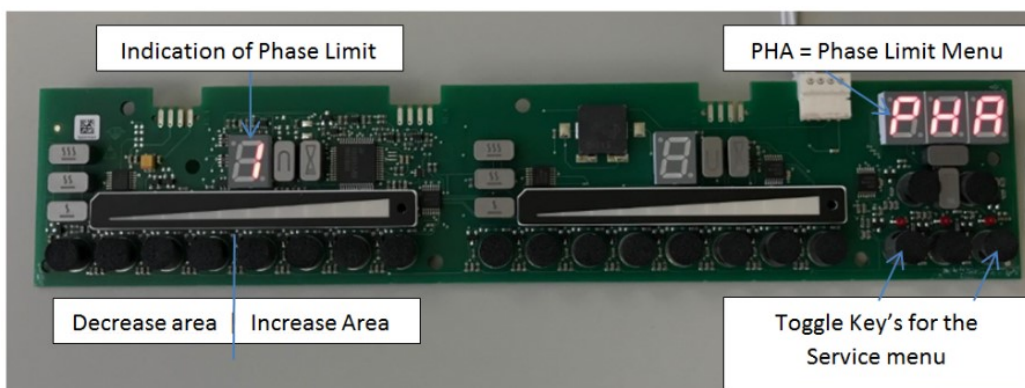
Menu items which can be selected using the special functions keys:

1. **[CF6]** for “**ConFiGuration**”
2. **[UEr]** for “**VERsion**”- shows the TC- software version number
3. **[UAr]** for “**VARiant**”- shows the TC- software variant number
4. **Display test**- switches all available LEDs and 7-segment displays on (fully illuminated).
5. **DemoMode “O”**

Optionally possible is the extended listing with **[PHA]** that can occur only in variants with Basic 4 Induction:

1. **[CF6]** for “**ConFiGuration**”
2. **[PHA]** for “**Phase Power Limit Menu**”- shows the settings for the Phase Power Limit Menu
3. **[UEr]** for “**VERsion**”- shows the TC-software version number
4. **[UAr]** for “**VARiant**”- shows the TC-software variant number
5. **Display test**- switches all available LEDs and 7-segment displays on (fully illuminated).
6. **DemoMode “O”**

The user selects the power management configuration by changing the number on the display of the Flex master, the Flex slaves remain inactive in this case.



In order to confirm the selection and activate the settings both special function keys have to be pressed for 1 sec. This causes a reset and a new configuration of connected induction modules or LIN-power boards. In order to quit the menu without changing any setting or new configuration the main switch has to be pressed.

Behind the selected number is a configuration defined by the customer that includes:

- use reducing (standard) or limiting power management (only one power management limit is available for single-phase connection)
- maximum power per phase
- phase assignment to the up to 6 burners

[PHA]- Menu item is used in variants and falls if the customer wants to operate the same variant at different power connections.

7. Technical Data

7.1. Supply Ranges

- | | |
|-------------------------------|-----------------------------|
| • Rated voltage | 200 V - 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 |

7.2. Under/Over Voltage Protection

7.2.1. Under voltage protection

- | | |
|---------------------------|---|
| • Under voltage detection | $U_{\text{under}} < 180 \text{ V}$ |
| • Hysteresis for restart | typical $U_{\text{under}} + 10 \text{ V}$ |

7.2.2. 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 $T_u 40 \text{ }^\circ\text{C}$

7.3. 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 EGO user interface). Stand-by consumption is $P \leq 0.5 \text{ W}$ in all cooktops: induction systems as well RHE incl. power unit.

7.4. Ambient Temperature in Operation

PCB Ambient temperature:

- RHE: 0 °C ... 105 °C
- Induction: 85 °C

7.5. Humidity

- Admissible humidity: 95 % RH

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 TC 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.

7.6. Storage Temperatures

Valid for all components:

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

7.7. Lifetime

10 years thereof are 3,000 hours real cooking time.

TC is during the entire lifetime permanently powered on the defined permitted voltage.

7.8. Relays

7.8.1. Requirement on clock relay

- 250,000 switching cycles 230 V (400 V) / 10 A / T105 °C

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

7.8.2. Requirement on pole disconnection relays

- 20,000 switching cycles 250 V (400 V) / 16 A / T105 °C

(Ω -mic) requirement for the pole disconnection relays

7.8.3. 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.

7.9. Approvals

EGO Flex TC has been tested and has an own certificate of institutions:

- VDE
- UL

Remark: Customer documentation EGO Flex TC UL is available as separate document.

8. Maintenance and Repair

TC needs no periodical maintenance.

In case TC is damaged, the whole TC unit has to be replaced.

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.

9. Referenced Standards

9.1. Safety Standard

- DIN EN 60335- 1 (VDE 0700- 1):2012- 10; EN 60335- 1:2012
- EN 60335- 1:2012/A11:2014
- DIN EN 60335- 1 Ber.1 (VDE 0700- 1 Ber.1):2014- 04; EN 60335- 1:2012/AC:2014
Household and similar electrical appliances - Safety - Part 1: General requirements
- DIN EN 60335- 2- 6 (VDE 0700- 6):2013- 06; EN 60335- 2- 6:2003[+] A1[+] Cor.+ A2+A11+ AC+ A12+ A13:2013
- EN 60335- 2- 6:2015
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):2012- 10; EN 60730- 1:2011
Automatic electrical controls for household and similar use- Part 1: General requirements
- DIN EN 60730- 2- 11 (VDE 0631- 2- 11):2008- 09; EN 60730- 2- 11:2008
Automatic electrical controls for household and similar use- Part 2- 11: Particular requirements for energy regulators

9.2. 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- 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
- 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- 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

9.3. Usability

- EN 60350

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

9.4. Transport

Testing according to our special test protocol, variable testing procedures depending on intended transport routes (truck, sea shipment or air freight):

- Pre- air conditioning and climate testing
- Vertical vibration testing; trucking vibration; broadband vibrating simulation
- Vertical shock test; Simulation of potholes, uneven road surfaces, hard setting occurrences, etc. acc. DIN EN 60068- 2- 27
- Horizontal impact test, impact unbraked, truck braking actions and envelope forklift
- Horizontal impact test, inclined impact test acc. ASTM D880
- Tilting fall to the ground surface, rotational flat drop test acc. ASTM D6179
- Low- pressure test acc. ASTM D6653 (2006)

9.5. 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)