

Blast Chiller and Blast Freezer printed circuit board

EWFC

Introduction

The EWFC circuit board for Blast Chillers and Freezers was developed for Electrolux Z.G.I. by Eliwell, with the aim of fulfilling the following tasks:

- Satisfy customer's demand of new features
- Improve the user's interface
- Update the technological content of the circuit board

Presentation topics:

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- Operation pages 13 - 19
- Programming pages 20 - 24
- Parameters list pages 25 - 40
- Alarm pages 41 - 43

Features 1

USER:

- Food probe or time-controlled BC-BCF cycles.
- Hard and Soft Blast Chilling cycles.
- Administration of acoustic signals.
- Germicide lamp control (optional).

TECHNICAL:

- Running cycle memory (Power Failure message indication).
- Prearranged for HACCP system connection (optional).
- Automatic cycle type selection mode (probe or time).
- Automatic defrost.

Features 2

Food probe or time-controlled BC-BCF cycles.

A common way to operate the BC-BCF exclude the use of the probe for the preparation of several foodstuff. In this case it is necessary to pre-set a pull-down time, afterwards the appliance will switch from the blast chilling/freezing mode to the conservation mode.

Features 3

Hard and Soft Blast Chilling cycles.

Some foodstuff can withstand a very low air temperature during the chilling cycle, and this is useful to achieve the shortest pull-down time. Nevertheless vegetables or delicate dishes require a smoother chilling process, to preserve their characteristics unchanged.

For these reasons the Soft chilling works with higher internal temperature, -5°C , while the Hard chilling cycle is performed at -12°C .

Features 4

Administration of acoustic signals.

The EWFC manages four types of acoustic information, each one is characterised by a specific sound:

- Cycle end. ON/OFF with a ½" rate for 30".
- Cycle incorrect. ON/OFF ½" for 30".
- Pressure-switch alarm. ON/OFF with a 1" rate for 30".
- Probes alarm. 2" ON and 1" OFF for 30".

Features 5



Germicide lamp control.

The EWFC is prearranged to activate a UV-lamp. This optional feature is useful to sanitise the tools utilised for the food preparation.

The lamp can be activated only if the internal temperature is above 15° and the door is closed.

The lamp remains activated for ten minutes, afterwards it will be switched off automatically.

Features 6

Running cycle memory.

The EWFC board is equipped with a battery based device, that store for about one hour the time elapsed from a power failure.

Whenever this time is longer than 20', a blinking label "PF" is shown on the display, while the cycle restarts according to the previous selection.

Features 7

Pre-arrangement for HACCP system connection.

The Hazard Analysis and Critical Control Point can be implemented in two different ways:

- By a temperature recorder or a printer, when the appliance works as a stand alone unit.
- By connecting the unit to a computer controlled net, by means of a dedicated serial interface (EWRS), when the appliance works within a system in the kitchen.

Features 8

Automatic food-probe or time cycle selection.

The software of the EWFC is designed to recognise automatically when the probe is inserted in the food.

When the cycle is started, the difference between the temperature measured by the food probe and the internal temperature must remain above 7°C for 15". Otherwise the time cycle is automatically selected (110' for the BC and 270' for the BF).

Features 9

Automatic defrost.

The defrosting is automatically activated at the end of each BC-BF cycle. It lasts until the temperature of the evaporator reaches 10°C (15°C for the freezer). The defrost ends anyway after twenty minutes.

In conservation mode, the EWFC is programmed to perform a defrost every four hours. In this case, the cycle will end when the temperature reaches 10°C either in the positive and in the low temperature mode.

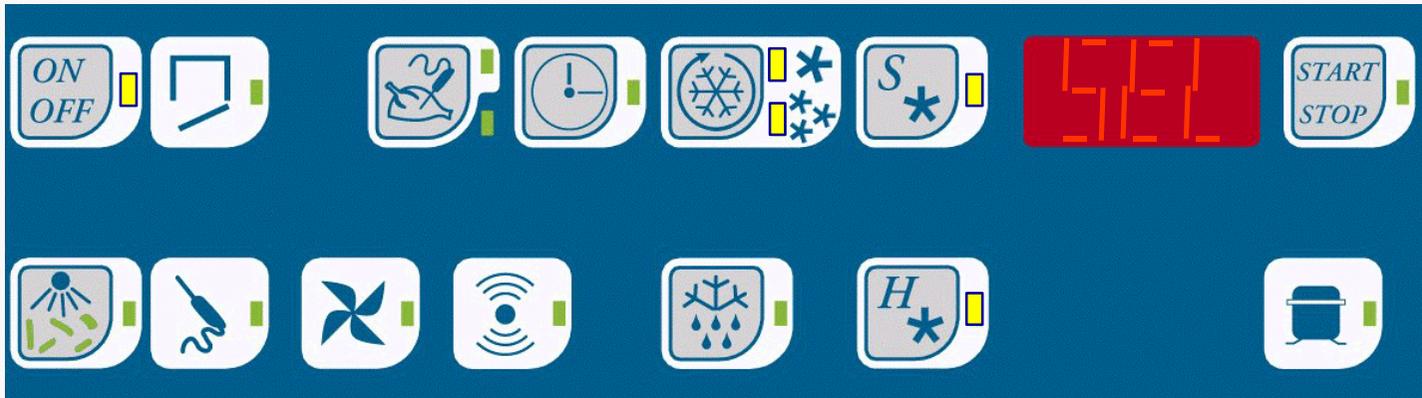
Operations 1



- Start up
- Cycle selection
- Time cycles
- Defrost
- Visualisation
- Alarms

(refer to the user's manual)

Operations 2



- START UP
- Push the ON/OFF button
 - The Cycle selection key leds will start to blink
 - By pushing the key once, the led beside the single star will lit.

Operations 3



Soft chilling cycle selection



Select the soft chilling cycle by pushing the indicated button, then START/STOP

The compressor will run continuously until the temperature has reached the set parameter value SCA (-5°C). Then it will work according to the measured internal temperature, until the core product temperature will reach the set value SSA (3°C). Afterwards the EWFC will switch into conservation mode, and the compressor will work until the air temperature will match the set SE1 (3°C). If you have selected the time chilling mode, the cycle will stop when the set time of 110' (parameter i1A) has elapsed.



To visualise the core product or cell temperature, during function, press the temperature display button

Operations 4



Hard chilling cycle selection



Select the hard chilling cycle by pushing the indicated button, then START/STOP

The compressor will run continuously until the temperature has reached the set parameter value SCH (-12°C). Then it will work according to the measured internal temperature, until the core product temperature will reach the set value SSH (3°C). Afterwards the EWFC will switch into conservation mode, and the compressor will work until the air temperature will match the set SEH (3°C). If you have selected the time chilling mode, the cycle will stop when the set time 110' (parameter iH2) has elapsed.



To visualise the core product or cell temperature, during function, press the temperature display button.

Operations 5

Selecting blast chilling / freezing cycles (Only BCF versions)



When you turn ON the appliance, push the indicated button to select the desired cycle . The one star led indicates the chilling cycle, the three stars indicate the freezing.



Select the soft chilling cycle by pushing the indicated button, then START/STOP



Select the hard chilling cycle by pushing the indicated button, then START/STOP

NOTE: It is not possible to select HARD / SOFT mode for the freezing cycle.



To visualise the core product or cell temperature during function, press the temperature display button.

Operations 6

Freezing cycle



Select the blast freezing cycle by pushing the indicated button, then START/STOP

The compressor will run continuously until the temperature has reached the set parameter value SCC (-38°C). Then it will work according to the measured internal temperature, until the core product temperature will reach the set value SSC (-18°C). Afterwards the EWFC will switch into conservation mode, and the compressor will work until the air temperature will match the set SE2 (-20°C). If you have selected the time freezing mode, the cycle will stop when the set time 270' (parameter i1C) has elapsed.



To visualise the core product or cell temperature during function, press the temperature display button.

Operations 7

Selecting a time cycle



In all the preceding phases, before to press START/STOP, press the indicated button. The predetermined time cycles are set by the manufacturer:

- 110 minutes for chilling cycles
- 270 minutes for freezing cycle

Keeping this key depressed for more than five seconds, will permit to decrease swiftly the set time. The value can be decreased slowly by depressing the button in rapid succession, until the desired value is display.

Selecting the defrost cycle



To select a defrost cycle manually, depress this button.

NOTE: It is not possible to begin the defrost during the blast chilling or freezing cycles .

Programming 1

- The EWFC board allows the adjustment of 80 operation parameters, through two Programming routines.
- 21 parameters can be visualised and have direct access (without password). These are the *USER* parameters.
- The remaining 59 values, the *SYSTEM* parameters, are accessible by password or by resetting the appliance.
- 11 further parameters are not visualised and not programmable.

Programming 2

To access the **USER** parameters, when the appliance is ON, but no cycles have been selected nor operative, proceed as follow:



Keep depressed contemporarily the buttons PROG* and START/STOP for 5 seconds.



The display will visualise the name of the first settable parameter : "diF". Push the button SET to see the value of the parameter.



Push the button UP (S) and DOWN (H) to set the desired value.



Push the button SET to store the new parameter. Proceed to the next parameters press the button UP (S).

* The PROG button is hidden beneath the command panel, at the lower-left corner. It is present also if the UV-Lamp logo is not printed on the label.

Programming 3

To access the **USER** parameters, when the appliance is OFF (but supplied), proceed as follow:



Keep depressed contemporarily the buttons PROG(*) and START/STOP for 5 seconds.



The display will visualise the name of the first settable parameter : "diF". Push the button SET to see the value of the parameter.



Push the button UP (H) and DOWN (ON/OFF) to set the desired value.



NOTE: BOARD FIRST VERSION

Push the button SET to store the new parameter. Proceed to the next parameters press the button UP (H).

(*) The PROG button is hidden beneath the command panel, at the lower-left corner. It is present also if the UV-Lamp logo is not printed on the label.

Programming 4

To adjust the **SYSTEM** parameters follow these instructions:
Disconnect the appliance from the mains.



Depress contemporarily the buttons PROG and START/STOP, at the same time **power-on the appliance**, maintain depressed the buttons for at least 5 seconds.



The display will visualise the first settable parameter : "diF". Push the button SET to see the value of the parameter.



Push the button UP (S) and DOWN (H) to set the desired value.



Push the button SET to store the new parameter. To adjust the next parameters press the button UP.

Programming 5

To access the **SYSTEM** parameters, when the appliance is ON, but no cycles have been selected nor operative, proceed as follow:



Keep depressed contemporarily the buttons PROG* and START/STOP for 5 seconds.



Push the button UP (S) until the label "tAb" is displayed. Than push PROG for 5 seconds. The label "PAS" will appear. Visualise the parameter with the SET button.



Push the button UP (S) and DOWN (H) until the NUMBER 573 is visualised, then press SET.

NOTE: At this point all the parameters are visible. The SYSTEM will differ from the USER as they are blinking.

* The PROG button is hidden beneath the command panel, at the lower-left corner. It is present also if the UV-Lamp logo is not printed on the label.

Programming 6

To adjust the **SYSTEM** parameters follow these instructions:
Disconnect the appliance from the mains.



Depress contemporarily the buttons PROG and START/STOP, at the same time **power-on the appliance**, maintain depressed the buttons for at least 5 seconds.



The display will visualise the first settable parameter : "diF". Push the button SET to see the value of the parameter.



Push the button UP (H) and DOWN (ON/OFF) to set the desired value.

NOTE: BOARD FIRST VERSION



Push the button SET to store the new parameter. To adjust the next parameters press the button UP.

USER parameters 1

Name	Value	Description
dif	3	Thermostat differential (°C)
tcA	20	Maximum defrost duration in chiller mode (minutes)
tcC	20	Maximum defrost duration in freezer mode (minutes)
diA	4	Defrost intervals in chiller mode (hours)
diC	4	Defrost intervals in freezer mode (hours)

USER parameters 2

Name	Value	Description
SCA	-5	Internal air temperature set point during the Soft Chilling cycle (°C).
SSA	3	Food probe set point to conclude the Soft chilling cycle (°C).
SE1	3	Conservation temperature set point in chiller mode (°C)
SCH	-12	Internal air temperature set point during the Hard Chilling cycle (°C).
SSH	3	Food probe set point to conclude the Hard chilling cycle (°C).

USER parameters 3

Name	Value	Description
SEH	3	Conservation temperature set point in chiller mode (°C).
SCC	-38	Internal air temperature set point during the Blast freezing cycle (°C).
SSC	-18	Food probe set point to conclude the Blast freezing cycle (°C).
SE2	-20	Conservation temperature set point in freezer mode (°C).
tAb		Not used (only for enter in system parameter).

USER parameters 4

Name	Value	Description
AtA	240	Alarm delay (minutes) in freezer/chiller mode.
dad	5	Device ID code, to identify the EWFC when it is connected to a computer.
FAA	0	Family ID code, to identify the EWFC when it is connected to a computer.
Pr1	10	Print interval (minutes).
Pr2	Y	Print after a "power fail".

USER parameters 5

Name	Value	Description
Pr3	Y	HACCP system (when the printer is connected).
PrL	Gb	Language of print (it, gb, de, fr, es, se).
Atc	15	Alarm delay (minutes) in conservation.

SYSTEM parameters 1

Name	Value		Description
	Chiller	Freezer	
LAC	15	15	Alarm differential: $T_{set} - T_{in} > LAC$ than alarm label Li ON (with delay AtA)
HAC	9	8	Alarm differential: $T_{in} - T_{set} > HAC$ than alarm label Hi ON (with delay AtA)
AFd	2	2	Alarm reset differential ($^{\circ}C$). If alarm happened at T° , than reset = $T^{\circ} \pm 2^{\circ}C$
dty	EL	EL	Defrost type (EL= Heaters, in = hot gas, Air = ventilation)

SYSTEM parameters 2

Name	Value		Description
	Chiller	Freezer	
dPo	Y	Y	Defrost enabled without evaporator probe
dbS	Y	N	Appliance type: Y = Blast Chiller, N = Blast Chiller and Freezer
dCP	SPd	SPd	Not used
dCi	SPd	SPd	Initial and time defrosts enabled
dEi	10	15	Initial defrost end temperature (°C)

SYSTEM parameters 3

Name	Value		Description
	Chiller	Freezer	
dEA	10	10	Evaporator temperature for defrost end, in chiller mode (°C)
dEC	10	10	Evaporator temperature for defrost end, in freezer mode (°C)
ddt	0	60	Dripping time (seconds)
dct	dF	rt	Defrost interval count mode: rt = Real time, dF = Digifrost
ddL	n	lb	Display mode during defrost: n = actual temperature, y = locked, lb = dEF label

SYSTEM parameters 4

Name	Value		Description
	Chiller	Freezer	
FSA	90	90	Fan stop temperature in chiller mode (°C) If $T^{\circ} > FSA$ than the blowers are stopped
FSC	90	90	Fan stop temperature in freezer mode (°C) If $T^{\circ} > FSA$ than the blowers are stopped
Ftd	0	30	Ventilators dripping time delay
i1A	110	110	Soft chilling time (minutes)
SH1	-12	-12	Not used

SYSTEM parameters 5

Name	Value		Description
	Chiller	Freezer	
SS1	3	3	Not used
iH1	0	0	Not Used
iH2	110	110	Hard Chilling time (minutes)
SrC	-38	-38	Not used

SYSTEM parameters 6

Name	Value		Description
	Chiller	Freezer	
SrS	-18	-18	Not used
irF	0	0	Not Used
S1C	-38	-38	Not Used
SFc	-18	-18	Not Used
iSc	0	0	Not Used

SYSTEM parameters 7

Name	Value		Description
	Chiller	Freezer	
i1C	270	270	Blast Freezing cycle time (minutes)
dod	y	y	Door switch working mode: y = compressor relay OFF
Fod	oF	oF	Ventilators mode with door open oF = OFF, on = ON
oAo	5	5	Temperature alarm delay with door open (minutes)
dSd	n	n	Light mode with door open: n = OFF, y = ON

SYSTEM parameters 8

Name	Value		Description
	Chiller	Freezer	
tLC	0	0	Light on timeout (seconds)
odt	5	5	Door open alarm delay (minutes)
PFt	20	20	Power Failure timeout: if PF time > PFt, than PF alarm ON (minutes)
dSr	15	15	Food probe detection timeout (seconds)
dPS	7	7	Temperature algorithm window for food probe detection (°C)

SYSTEM parameters 9

Name	Value		Description
	Chiller	Freezer	
cdP	1	1	Compressor protection timeout (seconds) Minimum time between two ON phases
dFu	P	P	Phase measurement type: P = minutes, H = hours
dro	°C	°C	Temperature mode: °C or °F
CAL	0	0	Cell Temperature probe offset
CIP	OP	OP	Pressure switch contact mode, OP = open, CL = Close

SYSTEM parameters 10

Name	Value		Description
	Chiller	Freezer	
FIP	OP	OP	Fan motors contact mode, OP = open, CL = close
Pad	0	0	Pressure switch alarm delay (minutes)
SLd	10	10	Sanitise-lamp ON time (minutes)
SLt	15	15	Sanitise-lamp ON temperature (°C) If Tin < 15°C than the lamp is OFF
bEn	4 bbl	4 bbl	Buzzer mode for cycle end sound. bbl= ½ second on and off for 30 seconds

SYSTEM parameters 11

Name	Value		Description
	Chiller	Freezer	
bPA	5 lbl	5 lbl	Buzzer mode for pressure switch alarm 1b1= 1 second on and off for 30 seconds
bCP	6-2bl	6-2bl	Buzzer mode for cell probe alarm 2b1= 2" on and 1" off for 30 seconds
bFC	4 bbl	4 bbl	Buzzer mode for cycle end incorrect bbl= ½ second on and off for 30 seconds
PrP	AP	EAP	Probe presence flag: AP= food probe, EAP= evaporator and food probe
tPO	15	15	Programming buttons timeout. If nothing is pressed after tPO, than EXIT (seconds)

SYSTEM parameters 12

Name	Value		Description
	Chiller	Freezer	
tP1	10	10	Display timeout (seconds)
Fdr	40	20	Ventilators on time during the defrost cycle (seconds): duty cycle= Fdr+Fds
FdS	120	120	Ventilators off time during the defrost cycle (seconds): duty cycle= Fdr+Fds
rEI	21	21	Firmware release number

Alarm 1

- The EWFC board has 11 different types of alarms.
- With these alarms the EWFC board has the possibility to check in a real time the proper working of the blast chiller & blast freezer.
- During the alarms the display visualises the alarm code (blinking or continuous) and the buzzer (buzzing or not buzzing).

Alarm 2

Alarm	Stuatus		Description
	Blinking Buzzer		
CP	NO	YES	Faulty inner liner probe alarm.
IP	YES	YES	Faulty temperature probe alarm.
EP	YES	YES	Faulty evaporator probe alarm.
Li	YES	YES	Inner liner low temperature alarm.
Hi	YES	YES	Inner liner high temperature alarm.
AL	NO	YES	Pressure switch maximun time alarm.

Alarm 3

Alarm	Stuatus		Description
	Blinking Buzzer		
FA	YES	YES	Fan motor alarm.
Od	YES	YES	Maximun time open door alarm.
Ot	YES	YES	Maximun time for chilling or freezing cycle over time alarm.
tF	YES	YES	Wrong time for the chilling or freezing cycle temperature failed alarm.
PF	YES	YES	Maximun time of power failure alarm.

INTEGRATED HACCP CONNECTORS AND CODES

