EK 356A

ON-OFF digital controller for electrical bread ovens

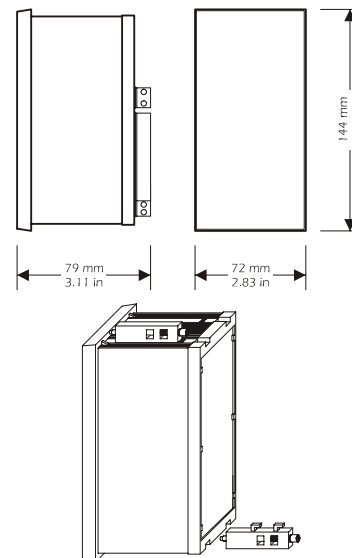**ENGLISH**

1   PREPARATIONS

1.1   How to install the instrument

Panel mounting, panel cut out 67 x 138 mm (2.63 x 5.43 in), with screw brackets (supplied by the builder).

144 mm
5.66 in

79 mm
3.11 in

72 mm
2.83 in

installation with screw brackets; moderate the clamping torque, in order not to damage box and screw brackets.

2   OPERATION

2.1   How to turn the instrument ON/OFF

▪ press   ⓪   for 2 s

During the normal operation the instrument shows the top temperature (in the display at the top), the floor temperature (in the display in the middle) and the cooking timer length (in the display at the bottom).

2.2   How to silence the buzzer

▪ press   ▼

2.3   How to turn the steam generator ON/OFF

▪ press   (image)

2.4   Steam injection

To inject steam:

▪ press   (image)

The steam will be injected if the steam generator is turned ON, for the time you have set with parameter tb1 or as long as you release button (image)

2.5   How to turn the extractor ON/OFF

▪ press   (image)

2.6   How to activate/deactivate function Economy

▪ press   (image)

During this function top and floor outputs will alternatively be activated for 50 % of the time you have set with parameter c1.

2.7   How to turn the chamber light ON/OFF

▪ press   (image)

3   TIMER FOR DELAYED STARTING

3.1   How to set the timer for delayed starting

To modify the timer for delayed starting:

▪ be sure the instrument is turned OFF

▪ press   (image)

▪ press   ▲ or ▼   within 4 s   [1]

▪ press   (image)

To activate the timer:

▪ be sure the instrument is turned OFF

▪ press   (image)   for 2 s

As soon as the time you have set with the procedure passes, the device will automatically turn ON [2] [3].

(1) you can set the timer for delayed starting between 1 and 99 h

(2) the instrument stores the course of the time every 30 min

(3) the first time the instrument stores the course of the value (after a lack of power supply) will take place after 15 min the power supply has recovered, in order to ensure the course storing even if the lacks take place over and over again.

4   COOKING TIMER

4.1   How to set the cooking timer

To modify the cooking timer:

- be sure the instrument is turned ON

- press ⊙

- press ▲ or ▼   within 4 s ⌐ (4)

- press ⊙

To activate/deactivate the timer:

- be sure the instrument is turned ON

- press ⊚   for 2 s ⌐

As soon as the time you have set with the procedure passes, the buzzer will be activated for the time you have set with parameter c4.

(4) you can set the cooking timer between 1 and 99 min.

5   WORKING SETPOINT

5.1   How to set the top setpoint

- press ⌄W⌃

- press ▲ or ▼   within 4 s ⌐ (5)

- press ⌄W⌃

(5) you can set the top setpoint between the limits you have set with parameters rA1 and rA2.

5.2   How to set the floor setpoint

- press ⌄W⌃

- press ▲ or ▼   within 4 s ⌐ (6)

- press ⌄W⌃

(6) you can set the top setpoint between the limits you have set with parameters rA1 and rA2.

6   CONFIGURATION PARAMETERS

6.1   How to set configuration parameters

Configuration parameters are arranged on two levels.

To gain access the first level:

- press ▲ and ▼   for 4 s ⌐ : the instrument will show PA

To select a parameter:

- press ▲ or ▼

To modify the value of the parameter:

- press ⌄W⌃ and ▲ or ▼

To gain access the second level:

- gain access the first level

- press ▲ or ▼   to select PA

- press ⌄W⌃ and ▲ or ▼   to select " -19 "

- press ▲ and ▼   for 4 s ⌐ : the instrument will show rO

To quit the procedure:

- press ▲ and ▼   for 4 s ⌐ or do not operate for about 60 s.

7   SIGNALS

7.1   Signals

LED	MEANING
⌄W⌃	LED top if it is lit, the top output will be turned ON
⌄W⌃	LED floor if it is lit, the floor output will be turned ON
on off	LED steam generator if it is lit, the steam generator will be turned ON
⊛	LED steam injector if it is lit, the steam injection will be running
⛲	LED extractor if it is lit, the extractor will be turned ON
◠	LED economy if it is lit, function Economy will be activated
☀	LED chamber light if it is lit, the chamber light will be lit
°C	LED Celsius degree if it is lit, the unit of measure of the temperature showed by the instrument will be Celsius degree
°F	LED Fahrenheit degree if it is lit, the unit of measure of the temperature showed by the instrument will be Fahrenheit degree
h	LED hour if it is lit, the unit of measure of the time showed by the instrument will be hour

11   ELECTRICAL CONNECTION

11.1   Electrical connection
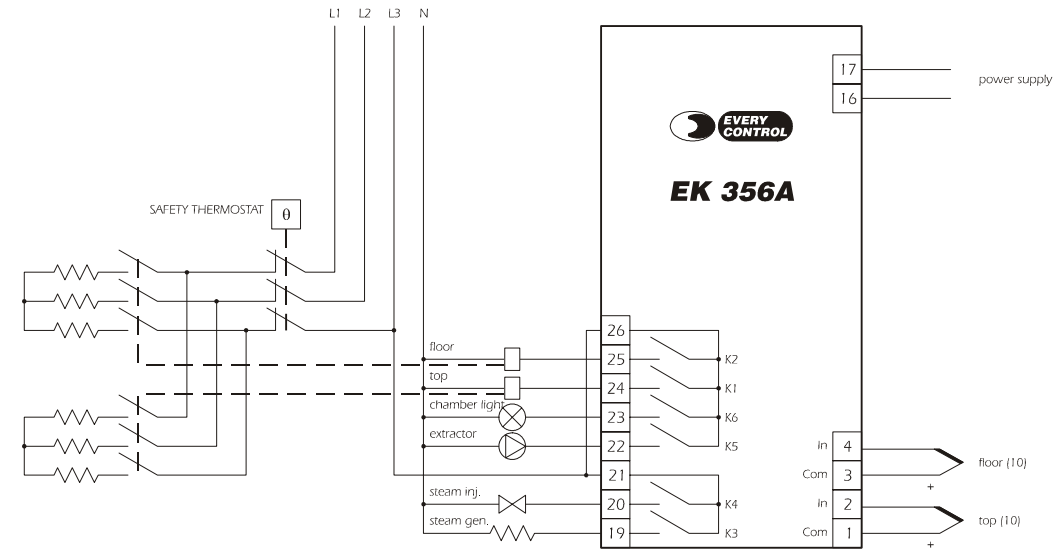
(10) provide the probe with a protection able to protect it against contacts with metal parts or use insulated probes.

LABEL	MIN.	MAX.	U.M.	DEF.	
AA4	1	7	—	1	kind of temperature alarm (1 = it will never be activated, 2 = absolute lower temperature alarm, 3 = absolute upper temperature alarm, 4 = lower temperature alarm relative to the top setpoint, 5 = upper temperature alarm relative to the top setpoint, 6 = lower temperature alarm relative to the top setpoint with automatic calculation and enabling, 7 = upper temperature alarm relative to the top setpoint with automatic calculation and enabling)

LABEL	MIN.	MAX.	U.M.	DEF.	SECOND ALARM (it is related to the floor temperature)
Ab0	1	99	°C/°F [7]	2	hysteresis (differential, it is relative to Ab1, it is important if Ab4 ≠ 1)
Ab1	-99	999	°C/°F [7]	0	second temperature alarm threshold (it is important if Ab4 ≠ 1); look at Ab4 as well
Ab3	0	999	min	0	second temperature alarm exclusion time since you turn the instrument ON (it is important if Ab4 ≠ 1)
Ab4	1	7	—	1	kind of temperature alarm (1 = it will never be activated, 2 = absolute lower temperature alarm, 3 = absolute upper temperature alarm, 4 = lower temperature alarm relative to the floor setpoint, 5 = upper temperature alarm relative to the floor setpoint, 6 = lower temperature alarm relative to the floor setpoint with automatic calculation and enabling, 7 = upper temperature alarm relative to the floor setpoint with automatic calculation and enabling)

LABEL	MIN.	MAX.	U.M.	DEF.	ECONOMY/COOKING TIMER
c1	1	999	s	80	cycle time to turn ON the top output and the floor output during function Economy [9]
c4	-1	120	s	5	time the buzzer is activated at the end of the cooking timer (-1 = the buzzer has to be silenced by hand)

LABEL	MIN.	MAX.	U.M.	DEF.	RESERVED
L1	—	—	—	—	reserved
L2	—	—	—	—	reserved
L3	—	—	—	—	reserved
L4	—	—	—	—	reserved

[7]   the unit of measure depends on parameter /8

[8]   ds = 0.1 seconds

[9]   during function Economy top and floor output will alternatively be activated for 50 % of the time you have set with parameter.

min	LED minute
	if it is lit, the unit of measure of the time showed by the instrument will be minute
start	LED timer
	if it flashes, the count of the timer for delayed starting (or the count of the cooking timer) will be running
⏻	LED ON STAND-BY
	if it is lit, the instrument will be in the STAND-BY mode (turned OFF)

INDICAT.	MEANING
0	the instrument has finished counting the cooking timer

8   ALARMS

8.1   Alarms

CODE	REASONS	REMEDIES	EFFECTS
E2 corrupted memory data alarm	there is a corruption of the configuration data in the memory of the instrument	turn OFF the power supply of the instrument: unless the alarm disappears, you will have to change the instrument	▪ the access to the setting procedures will not be allowed ▪ all outputs will be turned OFF
E0 top probe alarm	▪ the kind of top probe you have connected is not right ▪ the top probe plays up ▪ the connection instrument-top probe is wrong ▪ the top temperature is outside the limits allowed by the working range of the instrument	▪ look at parameter /0 ▪ test the integrity of the probe ▪ test connection instrument-probe ▪ test the temperature close to the probe	the top output will be turned OFF
E1 floor probe alarm	▪ the kind of floor probe you have connected is not right ▪ the floor probe plays up ▪ the connection instrument-floor probe is wrong ▪ the floor temperature is outside the limits allowed by the working range of the instrument	▪ look at parameter /0 ▪ test the integrity of the probe ▪ test connection instrument-probe ▪ test the temperature close to the probe	the floor output will be turned OFF
EOC cold joint alarm	there is a defect in the cold joint of the instrument	turn OFF the power supply of the instrument: unless the alarm disappears, you will have to change the instrument	▪ the top output will be turned OFF ▪ the floor output will be turned OFF
AL1 first temperature alarm	the top temperature is outside the limit you have set with parameter AA1	test the temperature close to the probe (look at parameters AA0, AA1 and AA4)	no effect
AL2 second temperature alarm	the floor temperature is outside the limit you have set with parameter Ab1	test the temperature close to the probe (look at parameters Ab0, Ab1 and Ab4)	no effect

The indications showed by the instrument flashes, except the indications "**AL1**" and "**AL2**" (they are alternated with the top or the floor temperature) and the buzzer utters an intermittent beep.

9   TECHNICAL DATA

9.1   Technical data

Box: self-extinguishing grey.

Size: 72 x 144 x 79 mm (2.83 x 5.66 x 3.11 in).

Installation: panel mounting, panel cut out 67 x 138 mm (2.63 x 5.43 in), with screw brackets (supplied by the builder).

Frontal protection: IP 54.

Connections: extractable terminal blocks with pitch 7.5 mm (0.29 in) for cables up to 2.5 mm² (0.38 sq in, power supply and outputs) and with pitch 5 mm (0.19 in) for

cables up to 2.5 mm² (0.38 sq in, inputs).

Ambient temperature: from 0 to 55 °C (32 to 131 °F, 10 ... 90% of relative humidity without condensate).

Power supply: 230 Vac, 50/60 Hz, 4 VA (standard) or 115 Vac, 50/60 Hz, 4 VA (by request).

Alarm buzzer: included.

Measure inputs: 2 (top and floor probe) for "J" or "K" thermocouples.

Working range: from 0 to 700 °C (32 to 999 °F) for "J" thermocouple, from 0 to 999 °C (32 to 999 °F) for "K" thermocouple.

Setpoint range: from 0 to 999 °C (0 to 999 °F).

Range of the timer for delayed starting: from 1 to 99 h.

Range of the cooking timer: from 1 to 99 min.

Resolution: 1 °F with unit of measure in Fahrenheit, 1 °C with unit of measure in Celsius.

Display: two red LED 3-digit displays 13.2 mm (0.51 in) high, one red LED 2-digit display 13.2 mm (0.51 in) high, output status indicators, indicators of the unit of measure of the temperature showed by the instrument.

Outputs: 6 relays: one 8 A @ 250 Vac relay for top heating group control (NO), one 8 A @ 250 Vac relay for floor heating group control (NO), one 10 A @ 250 Vac relay for steam generator control (NO), one 8 A @ 250 Vac relay for steam injection control (NO), one 8 A @ 250 Vac relay for extractor control (NO), one 8 A @ 250 Vac relay for chamber light control (NO); the maximum current allowed on terminal 21 and 26 is 10 A.

10   WORKING SETPOINT AND CONFIGURATION PARAMETERS

10.1 Working setpoint

LABEL	MIN.	MAX.	U.M.	DEF.	WORKING SETPOINT
	rA1	rA2	°C/°F [7]	0	top setpoint
	rA1	rA2	°C/°F [7]	0	floor setpoint

10.2 First level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	PASSWORD
PA	-90	100	—	0	password

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/1	-10	10	°C/°F [7]	0	top and floor probe calibration

LABEL	MIN.	MAX.	U.M.	DEF.	REGULATOR
rA0	-15	-1	°C/°F [7]	-2	hysteresis (differential, it is relative to the top and the floor setpoint)

10.3 Second level parameters

LABEL	MIN.	MAX.	U.M.	DEF.	MEASURE INPUTS
/0	10	11	—	10	kind of probe (10 = "J" Tc, 11 = "K" Tc)
/1	-10	10	°C/°F [7]	0	top and floor probe calibration
/2	0	6	—	3	probes reading speed (0 = fast, … , 6 = slow)
/4	0	1	—	0	display of non meaningful zeros (1 = YES)
/8	0	1	—	1	unit of measure temperature (0 = Fahrenheit degree, 1 = Celsius degree)

LABEL	MIN.	MAX.	U.M.	DEF.	REGULATOR
rA0	-15	-1	°C/°F [7]	-2	hysteresis (differential, it is relative to the top and the floor setpoint)
rA1	0	rA2	°C/°F [7]	0	minimum value you can assign to the top and the floor setpoint
rA2	rA1	999	°C/°F [7]	300	maximum value you can assign to the top and the floor setpoint

LABEL	MIN.	MAX.	U.M.	DEF.	STEAM INJECTION
tb0	1	255	s	1	minimum time between two steam injections in succession
tb1	1	255	ds [8]	10	minimum length of the steam injection

LABEL	MIN.	MAX.	U.M.	DEF.	FIRST ALARM (it is related to the top temperature)
AA0	1	99	°C/°F [7]	2	hysteresis (differential, it is relative to AA1, it is important if AA4 ≠ 1)
AA1	-99	999	°C/°F [7]	0	first temperature alarm threshold (it is important if AA4 ≠ 1); look at AA4 as well
AA3	0	999	min	0	first temperature alarm exclusion time since you turn the instrument ON (it is important if AA4 ≠ 1)