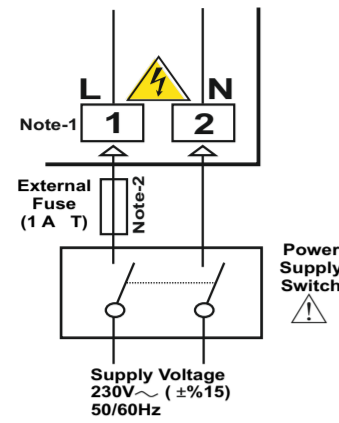## 9.2. Supply Voltage Input Connection of the Device

Note-1 : "L". Is (+), "N" is (-) for supply voltage

Note-2 : External fuse is recommended.

Make sure that the power supply voltage is same indicated on the instrument.
Switch on the power supply only after that all the electrical connection have been completed.
Supply voltage range must be determined in order. While installing the unit, supply voltage range must be controlled and appropriate supply voltage must be applied to the unit. Controlling prevents damages in unit and system and possible accidents as a result of incorrect supply voltage.

There is no power supply switch or fuse on the device. So a power supply switch and a fuse must be added to the supply voltage input. Power supply switch and fuse must be put to a place where user can reach easily. Power supply switch must be two poled for seperating phase and neutral. On/Off condition of power supply switch is very important in electrical connection. On/Off condition of power supply switch must be signed for preventing the wrong connection.

External fuse must be on phase connection in supply input.

Ordering Information

OVEN CONTROL DUAL	A	BC	D	E	/	FG	HI	/	U	V	W	Z
			0		/		00	/	0	0	0	0

A	Supply Voltage
2	24V ∿ 50/60Hz or 24V⎓ (± %15)
3	24V ∿ (± %15) 50/60Hz
4	115V ∿ (± %15) 50/60Hz
5	230V ∿ (± %15) 50/60Hz
9	Customer

BC	Input Type	Scale(°C)	Scale(°F)
23	J, Fe CuNi IEC584.1(ITS90)	0°C ile 350°C	32°F ile 660°F
25	K, NiCr Ni IEC584.1(ITS90)	0°C ile 350°C	32°F ile 660°F

E	Output-1 (Heater Output-1)
1	Relay Output (10A@230V∿ Resistive Load, 1NO + 1NC)
2	Ssr Driver Output (Max. 23mA, 11V)

FG	Output-2 (Heater Output-2)
01	Relay Output (10A@230V∿ Resistive Load, 1NO + 1NC)
02	Ssr Driver Output (Max. 23mA, 11V⎓)

EMKO
Your Technology Partner

Thank you very much for your preference to use Emko Elektronik products, please visit our web page to download detailed user manual.

www.emkoelektronik.com.tr

EMKO OVEN CONTROLLER-DUAL

EMKO
OVEN CONTROLLER-DUAL

- 4 displays which has 3 digits and 2 diplays which has 4 digits (For clock)
- 2 isolated thermocouple input - J or K (It must be determined in Order)
- Relay outputs to control 2 Heaters(no/nc), 4 Fans, Brulor, Steam, Lamp and Time-Out
- 1 door status input and 1 brulor failure input
- ON / OFF temperature control for 2 areas
- Limitation of set value
- For failure and set status internal buzzer
- 8 buttons to making different programs
- Selection of operation with hysteresis
- Adjustable temperature offset
- Auto-start feature with real time
- Password protection for programming mode

Instruction Manuel ENG OVENCONTROL-DUAL V07 07/23

1.Preface
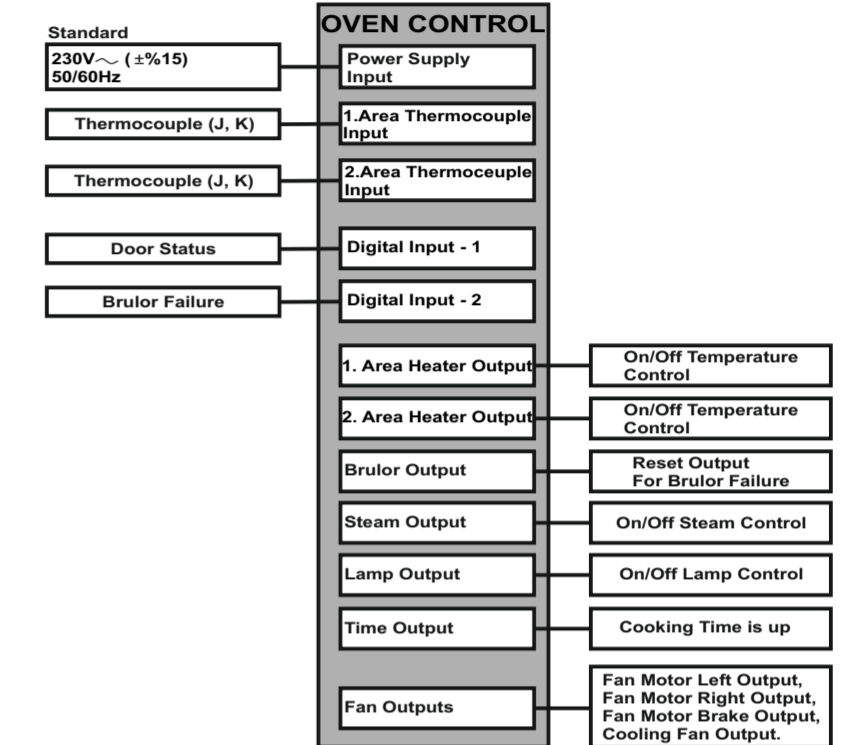
Oven Controller is designed to measure and control temperature for convection type ovens. It controls cooking at required time and set values.
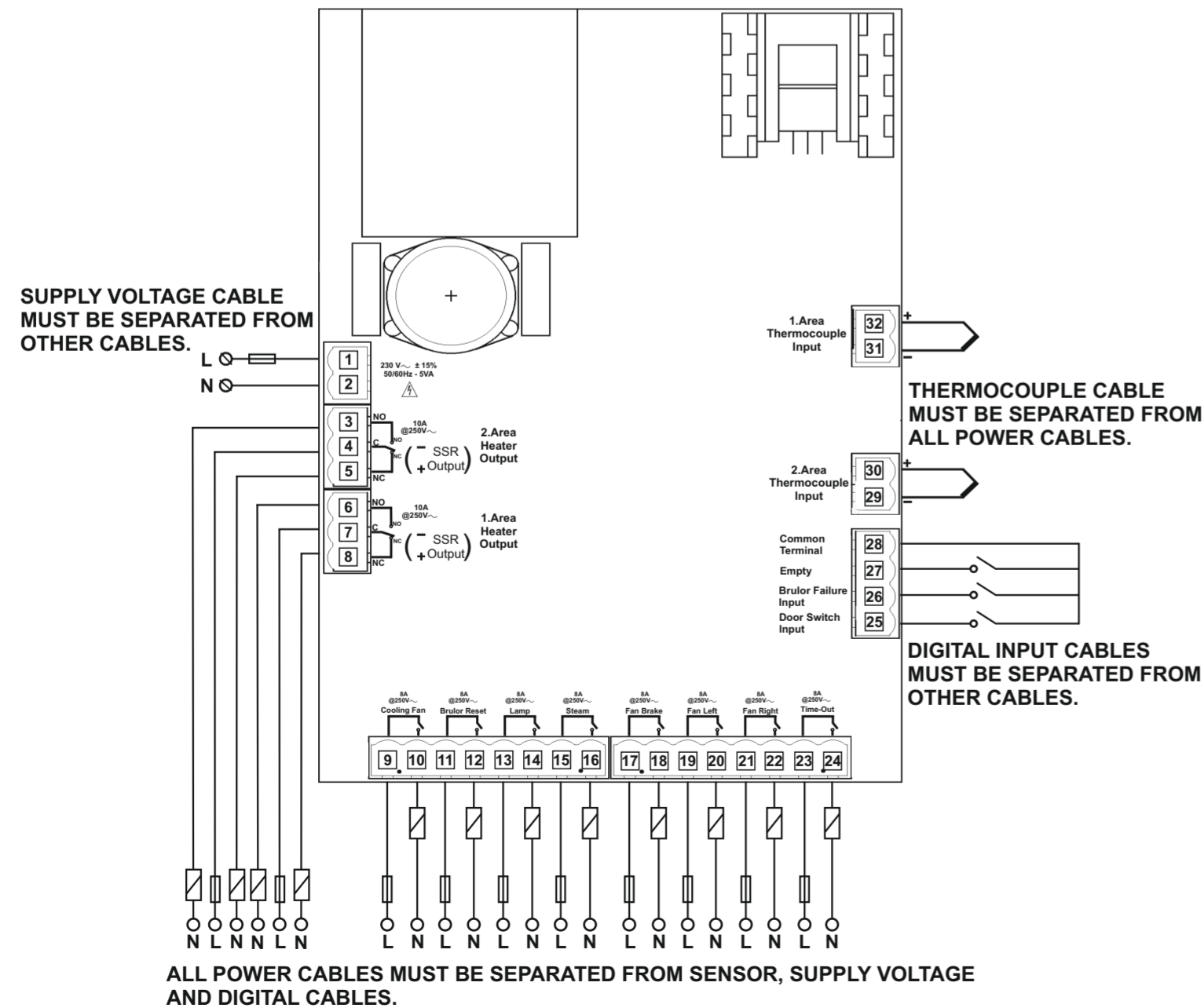
1.1 Operating Conditions

Operating Temperature	:	0 ile 50°C
Max. Operating Humidity	:	%90 Rh (non-condensing)
Altitude	:	Up to 2000 m

Forbidden Conditions:
Corrosive atmosphere,
Explosive atmosphere,
Home applications(The unit is only for industrial applications)

1.2 General Specification

TERMS OF RULES TO CONSIDER IN ELECTRICAL CONNECTION

SUPPLY VOLTAGE CABLE MUST BE SEPARATED FROM OTHER CABLES.

THERMOCOUPLE CABLE MUST BE SEPARATED FROM ALL POWER CABLES.

DIGITAL INPUT CABLES MUST BE SEPARATED FROM OTHER CABLES.

ALL POWER CABLES MUST BE SEPARATED FROM SENSOR, SUPPLY VOLTAGE AND DIGITAL CABLES.

1.3 Installation

Before beginning installation of this product, please read the instruction manuel and warnings below carefully.

A visual inspection of this product for possible damage occured during shipment is recommend before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product.

If there is danger of a seriour accident resulting from a failure or defect in this unit, power off the system and seperate the electrical connection of the device from the system.

The unit is normally supplied without a power supply switch or a fuse. Use power switch and fuse as required.

Be sure the use the rated power supply voltage to protect the unit against damage and to prevent failure.

Keep the power off until all of the wiring is completed so that electric shock and trouble with the unit can be prevent.

Never attemp to disassemble, modify or repair this unit. Tampering with the unit may results in malfunction, electric shock or fire.

Do not use the unit in combustible or explosive gaseous atmospheres.

During the equipment is putted in hole on metal panel while mechanical installation some metal burrs can cause injury on hands, you must be careful.

Montage on the product on a system must be done with it's fixing clambs. Do not to the montage of the device with inappropriate fixing clamb. Be sure that the device will not fall while doing the montage.

It is your responsibility if this equipment is used in manner not specified in this instruction manuel.

1.4 Warranty

EMKO Elektronik warrants that the equipment delivered is free from defects in material and workmanship. This warranty is provided for period of two years. The warranty period starts from the delivery date. This warranty is in force if duty and responsibilities which are determined in warranty document and instruction manuel performs by the customer completely.
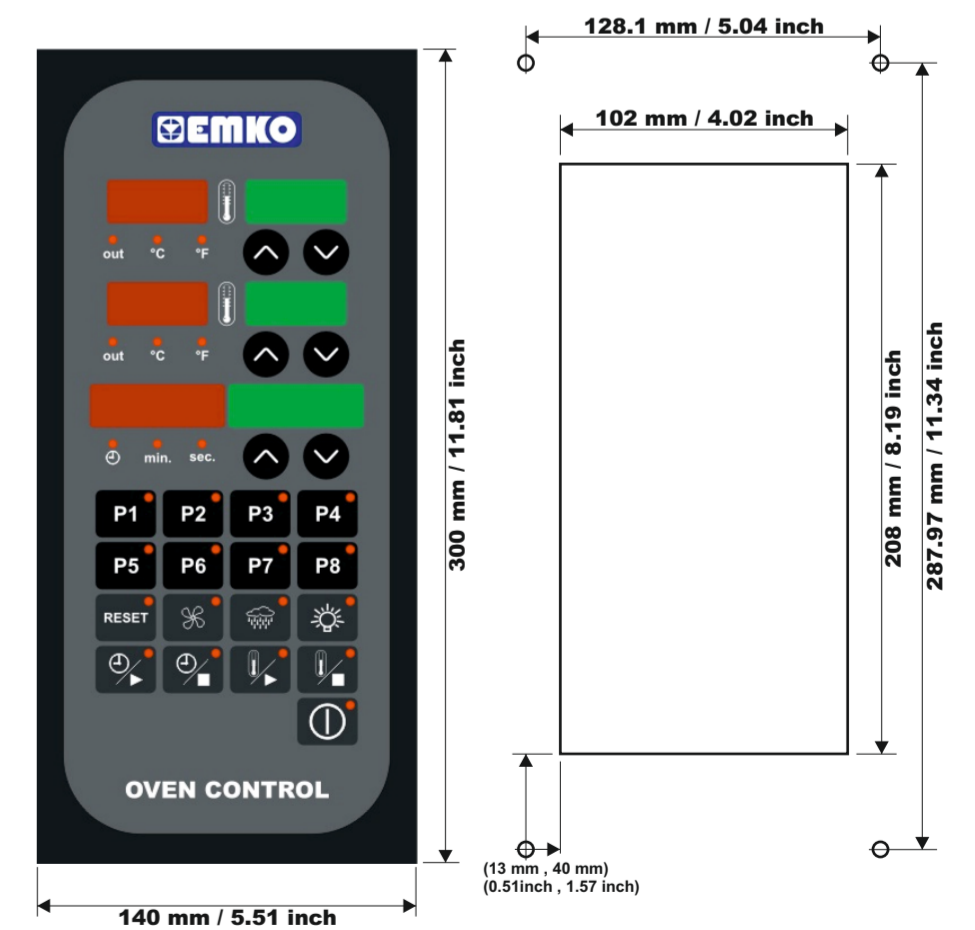
1.5 Maintenance

Repairs should only be performed by trained and specialized personel. Cut power to the device before accesing internal parts.
Do not clean the case with hydrocarbon-based solvents(Petrol,Trichlorethylene etc.). Use of these solvents can reduce the mechanical reliability of the device. Use cloth dampened in ethyl alcohol or water to clean the external plastic case.
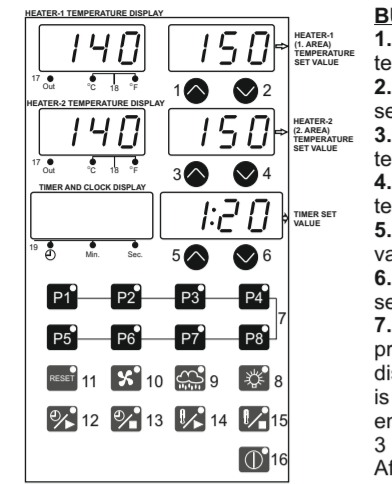
1.6 Manufacturer

Üretici Firma Bilgileri :
Emko Elektronik Sanayi ve Ticaret A.Ş.
Bursa Organize Sanayi Bölgesi, (Fethiye OSB Mah.)
Ali Osman Sönmez Bulvarı, 2. Sokak, No:3 16215 BURSA/TÜRKİYE
Tel : (224) 261 19 00   Fax : (224) 261 19 12

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2. Dimensions

128.1 mm / 5.04 inch

102 mm / 4.02 inch

300 mm / 11.81 inch

208 mm / 8.19 inch

287.97 mm / 11.34 inch

140 mm / 5.51 inch

(13 mm , 40 mm)
(0.51inch , 1.57 inch)
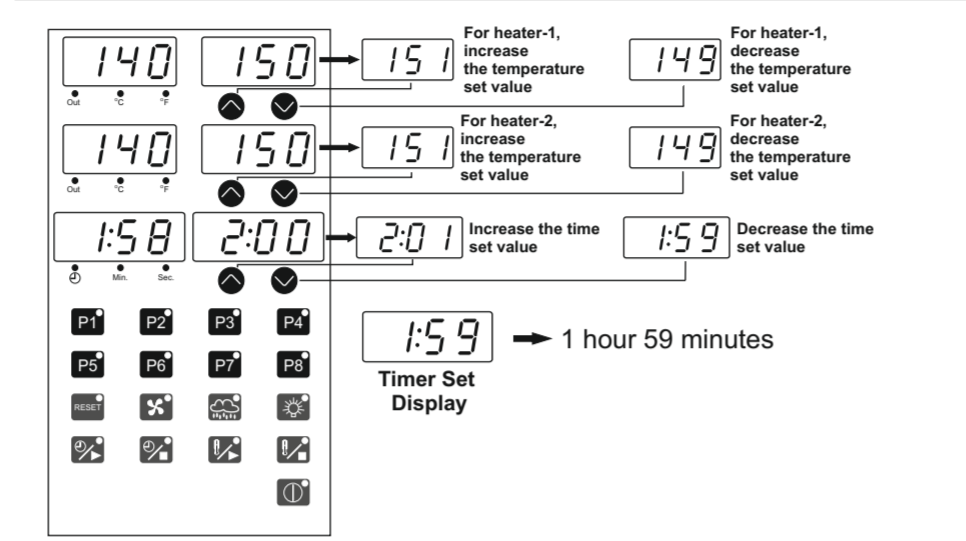
3. Description of The Front Panel

BUTTON DESCRIPTIONS
1. First Area Increament Button : It is used to increase temperature set value and parameters in programming mode.
2. First Area Decreament Button : It is used to decrease the set value and parameters in programming mode.
3. Second Area Increament Button : It is used to increase temperature set value.
4. Second Area Decreament Button : It is used to decrease temperature set value.
5. Timer Increament Button : It is used to increase timer set value.
6. Timer Decreament Button : It is used to decrease timer set value.
7. Program Buttons : The required program is selected by pressing the program buttons. Set values appear on the displays belong to program button which program led indicator is active. Also it is used to save the entered set values. After entering set values, the desired program button is pressed for 3 seconds to save set values. Set displays blink during saving. After the saving is finished, blink is finished.

8. Lamp Button : It is used to turn on/off lamp. If lamp lights on, lamp led at the top of the button lights on.
9. Steam Button : If the temperature is greater than the set temperature of the steam in programming mode, the steam output will be on after the steam button is pressed. If the steam is on, the steam led lights on.
10. Fan Button :
*Fan led lights on when cooking.
**If the fan button is pressed when the oven door is opened, the cooling fan starts to run and the fan led blinks. If the oven door is closed or the fan button is pressed again, the cooling fan stops.
11. Reset Button :
*It is used to access hidden parameters. It saves the changing parameters. If the reset button is pressed for 3 seconds, the hidden parameters are accessed and the reset led blinks.
**If the brulor failure input is active when the oven starts cooking, the reset button is pressed to reset the brulor.
12. Timer Start Button : It is used to start cooking time. If cooking time is started, the timer start led at the top of the button lights on.
13. Timer Stop Button : It is used to stop cooking time. If cooking time is not started, the timer stop led lights on.
14. Temperature Start Button : It is used to start cooking. If cooking is started, the temperature start led lights on.
15. Temperature Stop Button : It is used to stop cooking. If cooking is stopped, the temperature stop led lights on.
16.ON/OFF Button : It is used to open or close the device. If the device is off, the on/off led lights on. If the device is on, the on/off led lights off.
17.Out Led : If heater outputs are active, these leds light on. If heaters are not active, these leds light off.
18.°C and °F Leds : If celcius is selected in programming mode, the celcius led lights on,the fahrenheit led lights off. If fahrenheit is selected in programming mode, the fahrenheit led lights on, the celcius led lights off.
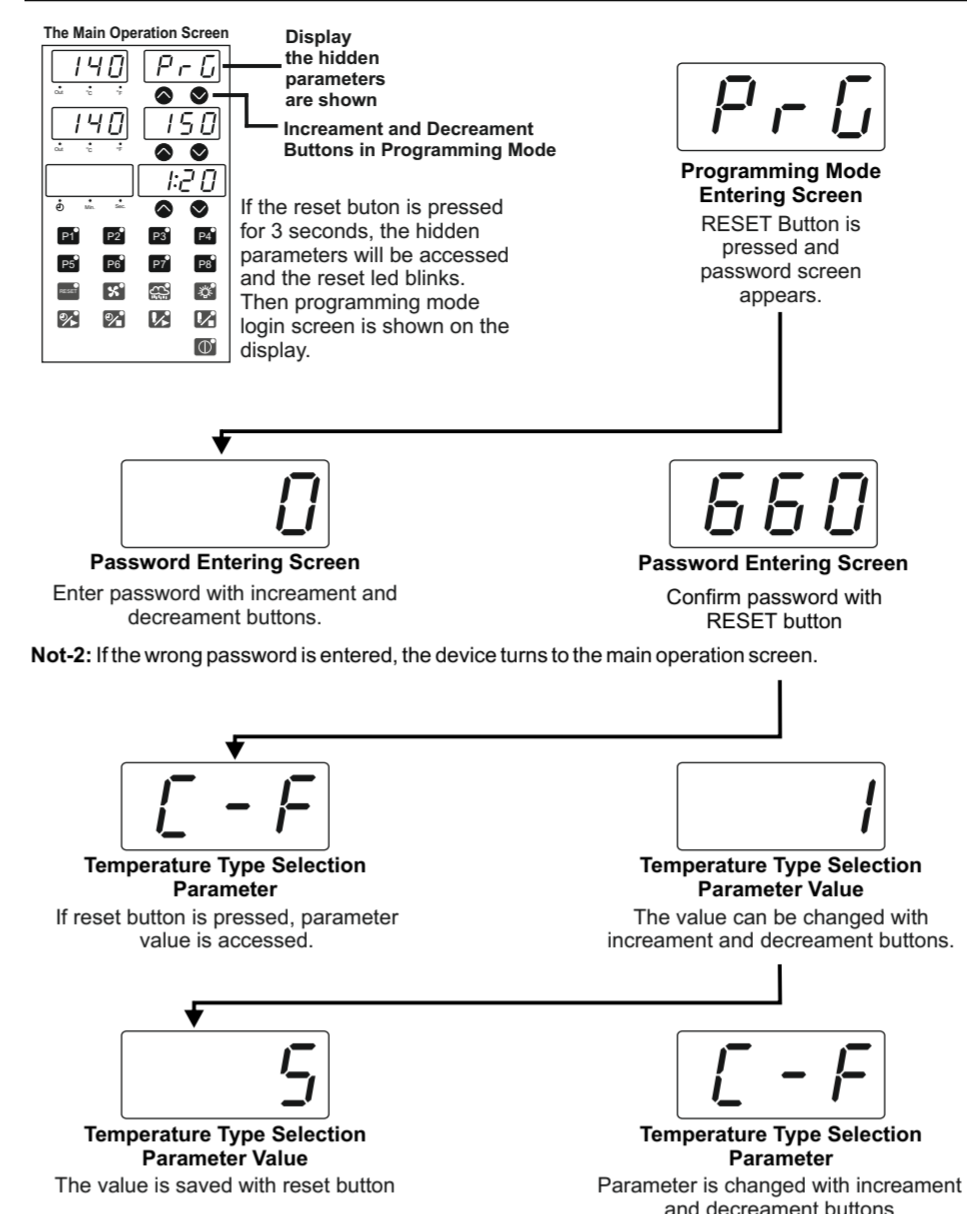
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19. Timer Display Leds : If decreasing counting is selected in programming mode, the hour (t) and minute (min.) leds light on when starts counting time. Last a minute, the hour led light off and the second led (sec.) lights on and it counts the number of seconds the back from 59. If increasing counting is selected in programming mode, the second (sec.) and minute (min.) leds light on when starts counting time. For first a minute, it counts the number of seconds. Then it counts the number of minutes and the hour led lights on, the second led lights off.

4. Change and Save Set Values

For heater-1, increase the temperature set value

For heater-1, decrease the temperature set value

For heater-2, increase the temperature set value

For heater-2, decrease the temperature set value

Increase the time set value

Decrease the time set value
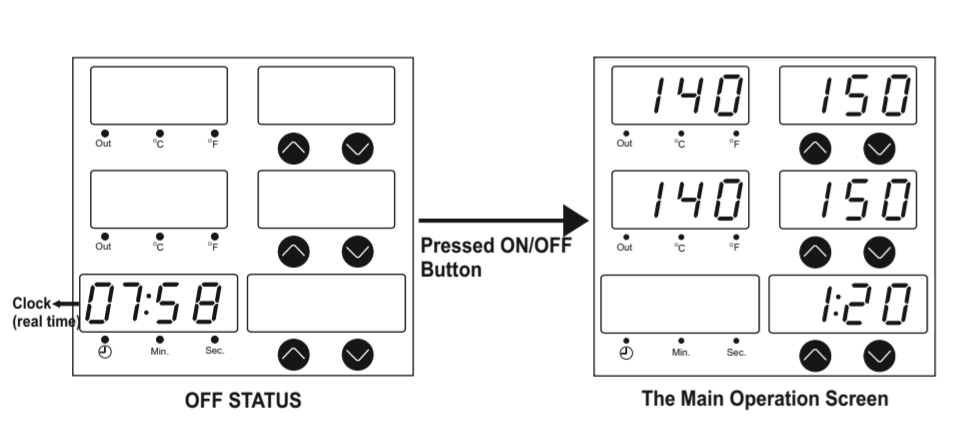
Timer Set Display

→ 1 hour 59 minutes

Set values can be changed at anytime. The required program (P1..P8) is selected by pressing the program buttons. Program set values appear on the displays. Also these buttons are used to save the entered set values. After entering set values, the required program button is pressed for 3 seconds to save set values. Set displays blink during saving. After the saving is finished, they are not blink. After entering set values, if any program buttons are not pressed, set values are saved in a temporary register and all of the program leds light off. After the device is turned off and turned on again, the most recent set values appear on the displays.

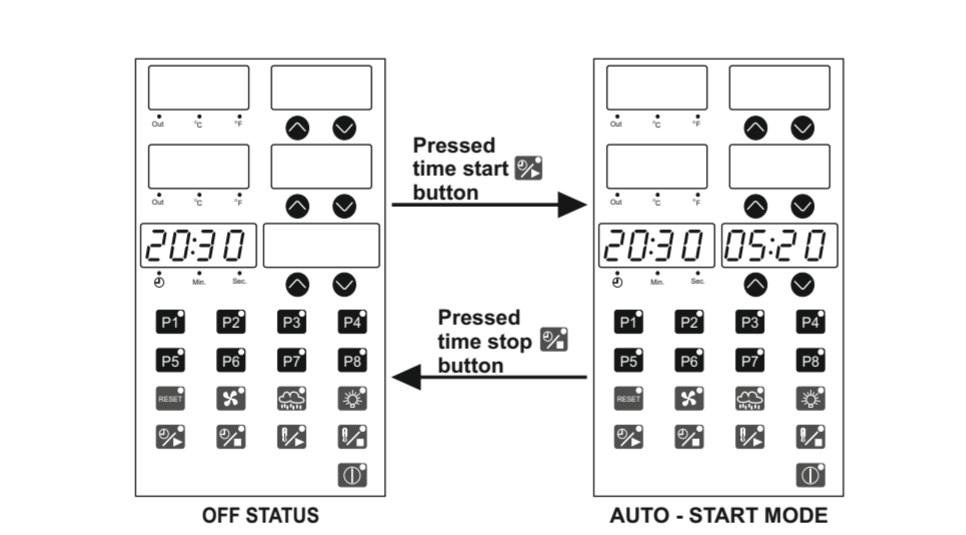## 7.1 Enter Programming Mode, Change and Save the Hidden Parameters

The Main Operation Screen

Display the hidden parameters are shown

Increament and Decreament Buttons in Programming Mode

If the reset button is pressed for 3 seconds, the hidden parameters will be accessed and the back led blinks. Then programming mode login screen is shown on the display.

Programming Mode Entering Screen
RESET Button is pressed and password screen appears.

Password Entering Screen
Enter password with increament and decreament buttons.

Password Entering Screen
Confirm password with RESET button.

Not-2: If the wrong password is entered, the device turns to the main operation screen.

Temperature Type Selection Parameter
If reset button is pressed, parameter value is accessed.

Temperature Type Selection Parameter Value
The value can be changed with increament and decreament buttons.

Temperature Type Selection Parameter Value
The value is saved with reset button

Temperature Type Selection Parameter
Parameter is changed with increament and decreament buttons

(i) If no operation is performed in programming mode for 10 seconds, the device turns to the main operation screen automatically.

7.2. Program Parameters

C - F Temperature Type Selection Parameter
According to this parameter, minimum and maximum values of the other parameters are set as celsius or fahrenheit automatically.
[0]   Select celsius for operations.
[1]   Select fahrenheit for operations.

t S P Temperature Control Parameter
If thermocupls break (first or second area or both of them), the device stops cooking. In this situation, power of the device must be cutted.
[0]   The device controls operations with first area temperature value. (Except to sensor break problems)
[1]   The device controls operations with second area temperature value. (Except to sensor break problems)
[2]   The device controls operations with both first and second area temperature value.

o F 1 1.Area Temperature Offset Parameter
Range : 0°C - ± 20°C (-4°F - 68 °F)

o F 2 2.Area Temperature Offset Parameter
Range : 0°C - ± 20°C (-4°F - 68 °F)

H S 1 Hysteresis Parameter for Heater-1 Output
Range : 1°C to 10°C or 33°F to 50°F

H S 2 Hysteresis Parameter for Heater-2 Output
Range : 1°C to 10°C or 33°F to 50°F

S t t Steam Temperature Set Parameter
Range : 50 - 200°C (122 - 392°F)
If temperature is greater than this parameter value, the steam output will be on. Otherwise the staem output will be off.

S t E Steam Duration Parameter
If the Steam Duration Parameter is selected as zero, then the steam output wil be on during the Steam button is pressed. If the parameter value is different from zero, after pressing the steam button, output will be on during the Steam Duration Parameter value. If Steam button is pressed when steam output is on, steam output will be off.

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5. How to Works the Device

Clock (real time)

Pressed ON/OFF Button

OFF STATUS

The Main Operation Screen

The cooked product is placed into the oven. When the device is energized, it is opened in off status and [07:58] clock appears. [01]The on/off button is pressed to turns the main operation screen. The set values are values that existed before the device turns off. [timer] The temperature start button is pressed to start cooking. Set values can be changed while cooking. [temp] The temperature stop button is pressed to stop cooking.
If the temperature start button is pressed to start cooking when the door of oven is opened, the device doesn't start cooking and [oPn] message appears and buzzer is activated. If the temperature start button is pressed when the door of oven is closed, The device starts cooking . Heaters start heating up the oven. According to fan status parameter, fan rotates right or both right and left. The door of oven can be opened while cooking, cooking stops and [oPn] message appears. Then cooking starts automatically, if the door is closed again.
The product can be cooked in a required time using the timer feature of the device. If [timer] the timer start button is pressed, the timer is activated and counting starts. If [timer] the timer stop button is pressed, counting stop but the device continues to cook. When the set time is finished, Buzzer and TIME-OUT output is activated, but cooking doesn't stop. The timer stop button is pressed to stop buzzer.
If the temperature is greater than the set temperature of the steam in programming mode, the steam output will be on after [steam] the steam button is pressed while cooking. If the temperature is lower than the set temperature of the steam in programming mode, [ur1] message apppears. If the Steam Duration Parameter is selected as zero, then the steam output wil be on during the Steam button is pressed. If the parameter value is different from zero, after pressing the steam button, output will be on during the Steam Duration Parameter value. If Steam button is pressed when steam output is on, steam output will be off.
If [fan] the fan button is pressed when the oven door is opened, the cooling fan starts to run and the fan led blinks. If the oven door is closed or the fan button is pressed again, the cooling fan stops. If temperature is greater than this parameter value, cooling fan will be active when the oven door is opened. Otherwise it will be inactive and [ur2] message appears. If the door is open after cooling stops, [ur2] message appears. If cooling fan auto-start time parameter is different from zero, cooling fan will be active during the set time at the door is open. It will be inactive after the set time.

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6. Auto - Start Mode

Pressed time start button

Pressed time stop button

OFF STATUS

AUTO - START MODE

The device needs to be in off status to activate auto-start mode. Auto-start mode is activated by pressing the timer start button when the device is in off status. The timer start led lights on and set time is appeared to set auto-start clock on the timer set display. Auto-start clock can be changed by pressing the timer increament and decreament buttons. The changed value is saved automatically. A required program can be selected for auto-start with program buttons. If any program is not selected, the device starts with the program which was selected before off status. After auto-start mode is adjusted, the device starts cooking at set time automatically.
Auto-start mode can be cancelled by pressing the timer stop button. If the device is opened by pressing the on/off button, auto-start mode is cancelled.

F t Y Fan Status Parameter
Fan rotation is set in this parameter.
[0]   Fan always rotates right.
[1]   Fan rotates both right and left.

F r t Fan Right Rotation Time Parameter
Range : 10 sec - 240 sec
Fan rotation time is set for right direction.
[F t Y] Parameter must be "1".

F L t Fan Left Rotation Time Parameter
Range : 10 sec - 240 sec
Fan rotation time is set for left direction.
[F t Y] Parameter must be "1".

F S t Fan Stop Time Parameter
Range : 10 sec - 240 sec
When fan rotates right or left, it is fan stop time before changing direction.
[F t Y] Parameter must be "1".

C F t Cooling Fan Temperature Parameter
Range : 10 - 100°C (50 - 212 °F)
If temperature is greater than this parameter value, Cooling fan will be active when the oven door is opened. Otherwise it will be inactive.

t C F Cooling Fan Auto-Start Time Parameter
Range : 0 - 999 seconds
If this parameter is selected as zero, auto-start will be inactive. If the parameter is different from zero, cooling fan will be active during the set time at the door is open. It will be inactive after the set time.

L t t Lamp Time Parameter
Range : 0 - 100 seconds
If the parameter is selected as zero, lamp lights on after the lamp button is pressed. Then lamp lights off if the lamp button is pressed again, otherwise lamp always lights on. If the parameter is different from zero, lamp lights on after the lamp button is pressed during the set time.

E r t Thermocupl Reverse Connection Control Time Parameter
Range : 0 - 250 minutes
The device controls sensor connection during this parameter value when cooking starts. If there is a problem, [t C r] message is appeared on the display and cooking stops. If this value is selected as zero, the device does not control sensor connection.

U d C Timer Counting Direction Parameter
The timer is set to the count information
[0]   The timer counts downward. It couns until the '0' value.
[1]   The timer counts upward. It counts to the set value from zero.

C t o Operation Time of The Oven Record Parameter
This parameter is automatically saved how many hours did the cooking. The record is made until 999 hours and fixed in 999. To avoid this, you can enter this parameter content and reset it.

H o r Hour Setting Parameter For Real Time Clock
This parameter can take a value from '0' to '23'.

M i n Minute Setting Parameter For Real Time Clock
This parameter can take a value from '0' to '59'.

P A S Programming Mode Accessing Password
It is used for accessing to the programming mode. It can be adjusted from '0' to '999'.

8. Failure Messages

1- If sensor connection is wrong or there is no sensor conection, [S b r] message appears on the display and cooking stops.

2- If [b r L] message appears when the device starts cooking, this means that fail to spark the brulor. The brulor is sparked again by pressing the reset button.

3- The device controls sensor connection during this parameter value when cooking starts. If there is a problem, [t C r] message is appeared on the display and cooking stops. If this value is selected as zero, the device does not control sensor connection.

6- [o P n]This message means that the door of oven is opened. If The door is opened, the device will not start cooking.

7- [C L S]This message means that the door is closed when the cooling fan starts.

8- [u r 1] This message means that the temperature is inadequate. If the steam button is pressed to activate the steam output when the temperature is lower than the value in steam temperature set parameter, this message appears.

9- If the fan button is pressed to start the cooling fan when the temperature is lower than the value in cooling fan temperature parameter, [u r 2]message appears.