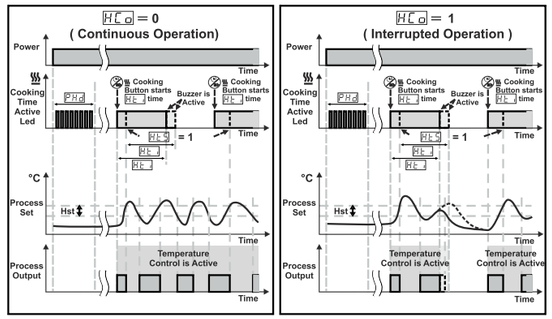
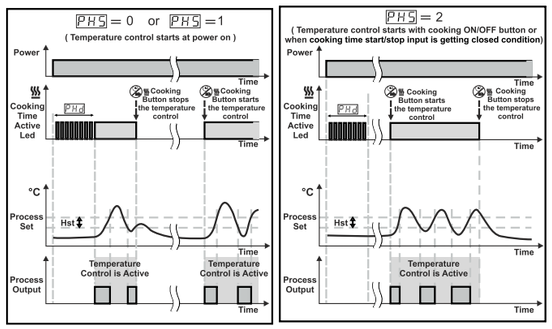
3- When cooking time parameter $H\,t_{\,1}$ ≥ 1, if selection of temperature control and starting the cooking time parameter PHS = 2 (Temperature control and cooking time (Timer) can be started by pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition) is selected;

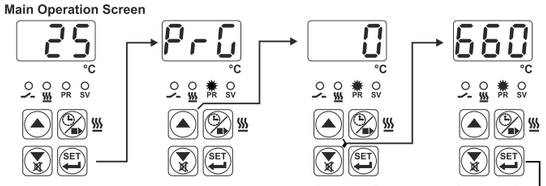


4- Manual Control : If cooking time (Timer) $H\,t_{\,1}$ = ---



4.7 Entering to the Programming Mode, Changing and Saving Parameters

Main Operation Screen



When SET button is pressed for 5 seconds, “PR” led starts to blink. If programming mode entering password is different from 0, programming mode entering screen PrG is observed.

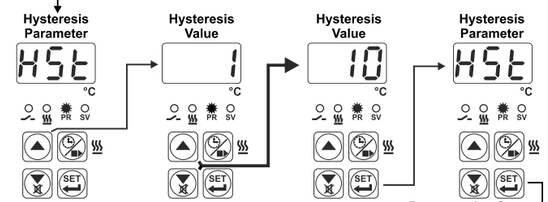
Programming Mode Entering Screen
Press increment button for accessing to the password entering screen.

Password Entering Screen
Enter programming mode accessing password with increment and decrement buttons.

Password Entering Screen
Press SET/OK button for accessing to the parameters.

Note-1: If programming mode accessing password is 0, hysteresis screen HSt is observed instead of programming screen accessing password PrG

Note-2: Parameters can be observed by pressing SET/OK button in password entering screen without entering the programming mode entering password. But parameters can not be changed.



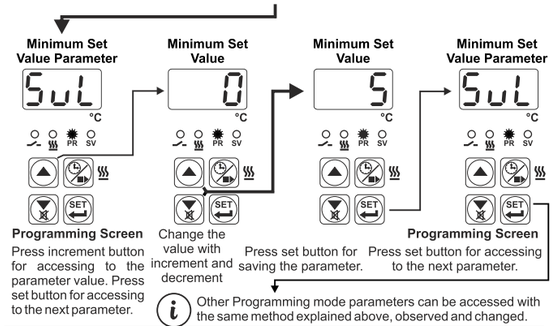
Hysteresis Parameter
Programming Screen
Press increment button for accessing to the parameter value. Press set button for accessing to the next parameter.

Hysteresis Value
Change the value with increment and decrement buttons.

Hysteresis Value
Press set button for saving the parameter.

Hysteresis Parameter
Programming Screen
Press set button for accessing to the next parameter.

If no operation is performed in programming mode for 20 seconds, device turns to main operation screen automatically.



Other Programming mode parameters can be accessed with the same method explained above, observed and changed.

5.Failure Messge in Heating Controller

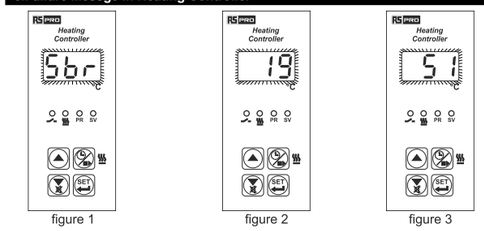


figure 1 figure 2 figure 3

1- Probe failure in analog inputs. Sensor connection is wrong or there is no sensor connection. When this message is on the screen, if buzzer function selection parameter buF is 3 or 4 , internal buzzer starts to operate. See figure 1.

2- Blinking the Screen Value
If temperature higher than the alarm parameters limit, value on the screen starts to blink

Example-1 :
If alarm function selection parameter $AL\,S$ In programming section is 1 (Absolute alarm) and minimum alarm parameter AuL is 20; When temperature is less than 20°C, value on the screen starts to blink. Also if buzzer function selection parameter buF is 2 or 4 , then internal buzzer is on. See figure 2.

Example-2 :
If alarm function selection parameter $AL\,S$ in programming section is 1 (Absolute Alarm) and maximum alarm parameter AuH is 50 When temperature is above 50 °C, value on the screen starts to blink. Also buzzer function selection parameter buF is 2 or 4, then internal buzzer is on. See figure 3.

6. Specifications

Device Type	: Heating Controler
Housing&Mounting	: 35 mm x 77 mm x 62.5 mm plastic housing for panel Mounting. Panel cut-out is 71 x 29 mm
Protection Class	: NEMA 4X (IP65 at front, IP20 at rear)
Weight	: Approximately 0.20 Kg.
Environmental Ratings	: Standard, indoor at an altitude of less than 2000 meters with none condensing humidity
Storage / Operating Temperature	: -40 °C to +85 °C / 0 °C to +50 °C
Storage / Operating Humidity	: 90 % max. (None condensing)
Installation	: Fixed installation
Overvoltage Category	: II.
Pollution Degree	: II, office or workplace, none conductive pollution
Operating Conditions	: Continuous
Supply Voltage and Power	: 230 V ~ (± 15%) 50/60 Hz. 1.5 VA 115 V ~ (± 15%) 50/60 Hz. 1.5 VA 24 V ~ (± 15%) 50/60 Hz. 1.5 VA 24 V ⎓ (- %15, + %10) 50/60 Hz. 1.5 VA 12 V ⎓ (± %15) 50/60 Hz. 1.5 VA
Temperature Sensor Inputs	: NTC, PTC, TC, RTD
NTC Input Type	: NTC (10 kΩ @.25 °C)
PTC Input Type	: PTC (1000 Ω @.25 °C)
Thermocouple Input Types	: J, K (IEC584.1)(ITS90)
Thermoresistance Input Type	: PT-100, PT-1000 (IEC751)(ITS90)
Accuracy	: ±1 % of full scale for thermocouple and thermoresistance
Cold Junction Compensation	: Automatically ± 0.1°C/1°C
Sensor Break Protection	: Upscale
Sampling Cycle	: 3 samples per second
Control Form	: ON / OFF
Relay Output	: 10 A@250 V ~ for resistive load (Electrical Life : 100.000 switching at full load)
Optional SSR Output	: Maximum 15 mA@5V ⎓
Display	: 14 mm Red 3 digits LED Display
LED	: SV (Green), Output (Red), PR (Red), Cooking Time Active (Red) 3 mm Led
Internal Buzzer	: ≥83dB
Approvals	: CE , EAC

RS PRO

Heating Controller

35 x 77 DIN Size

Internal Buzzer

CE UKCA EAC

35 x 77 DIN Size
Digital , ON / OFF Heating Controller

- *3 Digits display*
- *NTC Input or,*
  PTC Input or,
  J type Thermocouple Input or,
  K type Thermocouple Input or,
  2-Wire PT 100 Input or,
  2-Wire PT 1000 Input (It must be determined in order)
- *ON/OFF temperature control*
- *Adjustable temperature offset*
- *Set value low limit and set value high limit boundaries*
- *Relay or SSR driver output*
- Digital Input (Cooking time start/stop input)
- *Adjustable cooking time from front panel*
- Temperature control according to the cooking time (Timer)
- User can select to start cooking time (Timer) when temperature reaches to the set value
- *Temperature control with manual heating function*
- *Alarm parameters*
- *Adjustable internal buzzer according to cooking time , probe defect and alarm status*
- *Button protection*
- *Password protection for programming section*

1.3 Warranty

Warrants that the equipment delivered is free from defects in material and workmanship. This warranty is provided for a 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 manual performs by the customer completely.

1.4 Maintenance

Repairs should only be performed by trained and specialized personnel. Cut power to the device before accessing 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 a cloth dampened in ethyl alcohol or water to clean the external plastic case.

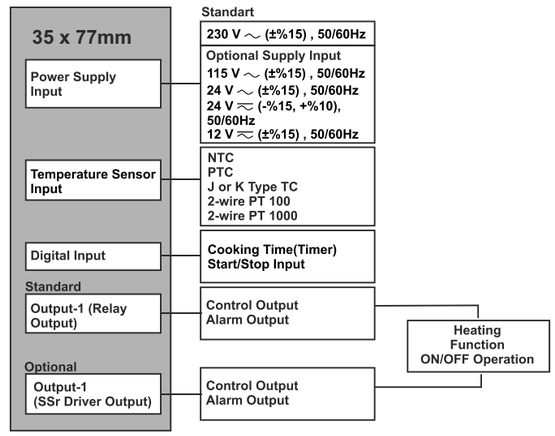
1.Preface

Series heating conrollers are designed for measuring and controlling temperature.
They can be used in many applications with their easy use, On/ Off control form and cooking time properties.
Some application fields which they are used are below:

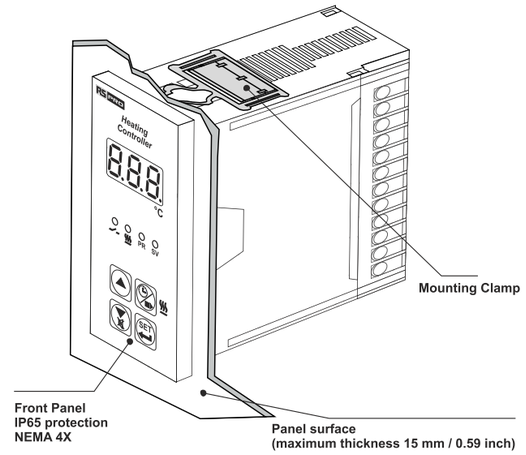
Application Fields
Glass
Food
Plastic
Petro-Chemistry
Textile, Automative
Machine Production Industries
etc...

Applications
Heating
Baking Ovens
Incubators
Storages
Air Conditioning
Etc...

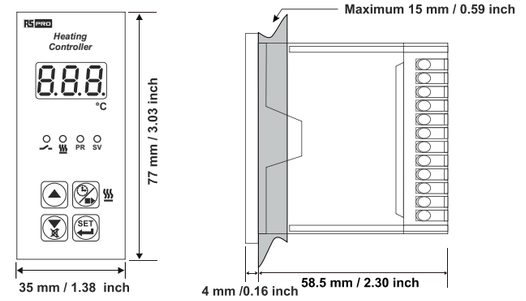
1.1 General Specifications



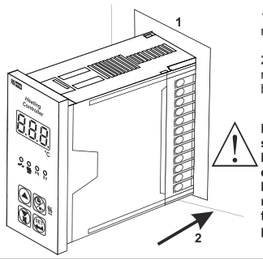
2.1 General Description



2.2 Front View and Dimensions of Heating Controller



2.3 Panel Mounting

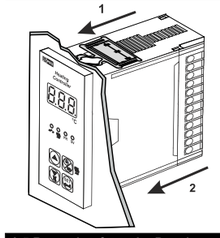


1-Before mounting the device in your panel, make sure that the cut-out is of the right size.

2-Insert the device through the cut-out. If the mounting clamps are on the unit, put out them before inserting the unit to the panel.

During installation into a metal panel, care should be taken to avoid injury from metal burrs which might be present. The equipment can loosen from vibration and become dislodged if installation parts are not properly tightened. These precautions for the safety of the person who does the panel mounting.

2.4 Installation Fixing Clamp



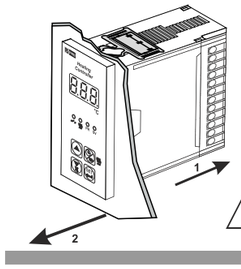
The unit is designed for panel mounting.

1-Insert the unit in the panel cut-out from the front side.

2- Insert the mounting clamps to the holes that located left and right sides of the device and make the unit completely immobile within the panel

Montage of the unit to a system must be done with it's own fixing clamps. Do not do the montage of the device with inappropriate fixing clamps. Be sure that device will not fall while doing the montage.

2.5 Removing from the Panel

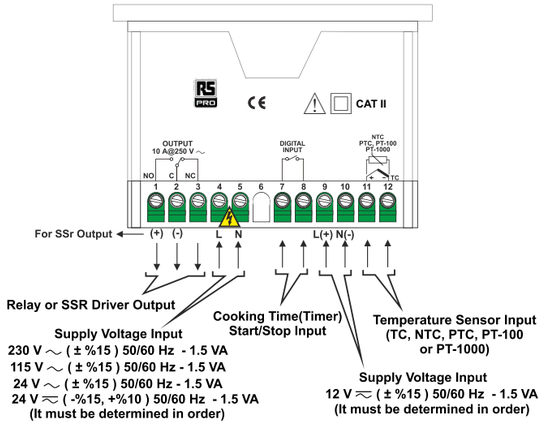


1-Pull mounting clamps from left and right fixing sockets.

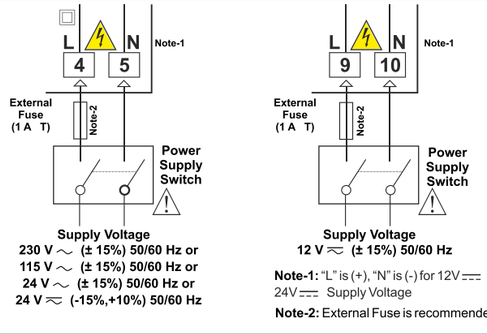
2-Pull the unit through the front side of the panel

Before starting to remove the unit from panel, power off the unit and the related system.

3 Electrical Wiring Diagram



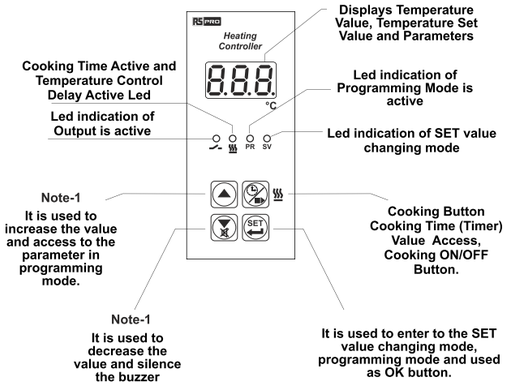
3.1 Supply Voltage Input Connection of the Device



Note-1: "L" is (+), "N" is (-) for 12V ⎓ and 24V ⎓ Supply Voltage

Note-2: External Fuse is recommended

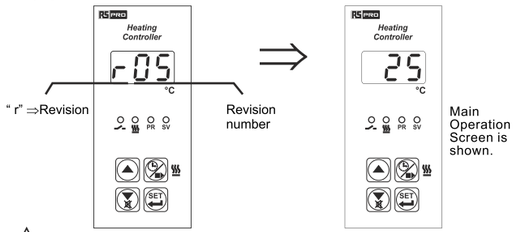
4. Front Panel Definition and Accessing to the Menus



Note-1: If increment or decrement button is pressed for 5 seconds continuously, increment and decrement number become 10, if increment or decrement button is pressed for 10 seconds continuously, increment and decrement number become 100.

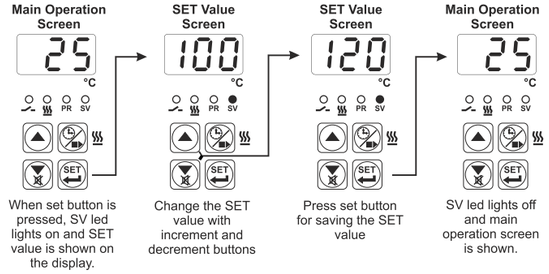
4.1 Observation of Software Revision on the Displays

When power is first applied to the temperature controller, software revision number is shown on the displays.



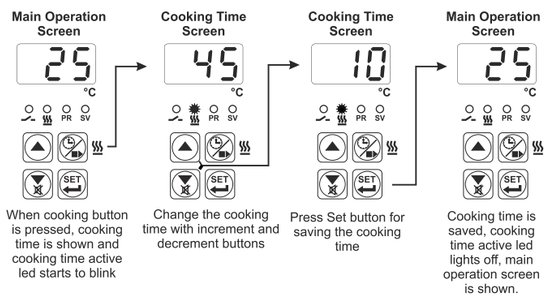
If there is an unexpected situation while opening the device, power off the device and inform a qualified personnel.

4.2 Changing and Saving Set Value



SET value changes according to maximum and minimum value of device type and scale. It can be adjusted from set value minimum parameter [SuL] value to set value maximum parameter [SuH] value.

4.3 Changing and Saving Cooking Time (Timer) Parameter

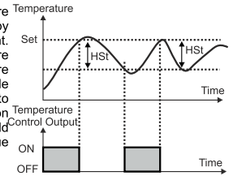


If no operation is performed in cooking time enter mode and set value enter mode for 20 seconds, device turns to main operation screen automatically.

4.4 Programming Mode Parameter List

HSt **Hysteresis Parameter for Output (Default = 1)**
From 1 to 100 °C for TC Type devices,
From 1 to 100 °C for PT-100 (-50°C , 400°C) and PT-1000 (-50°C , 400°C) ,
From 0.1 to 10.0 °C for PT-100 (-19.9°C, 99.9°C) and PT-1000 (-19.9°C, 99.9°C)
From 1 to 20 °C for PTC (-50°C, 150°C) and NTC (-50°C, 100°C),
From 0.1 to 10.0 °C PTC (-19.9°C, 99.9°C) and NTC (-19.9°C, 99.9°C)

In ON/OFF control algorithm, temperature value is tried to keep equal to set value by opening or closing the last control element. ON/OFF controlled system, temperature value oscillates continuously. Temperature value's oscillation period or amplitude around set value changes according to controlled system. For reducing oscillation period of temperature value, a threshold zone is formed below or around set value and this zone is named hysteresis.



SuL **Minimum Set Value Parameter (Default = Input Type Minimum Scale)**
Set value can not be lower than this value.
This parameter value can be adjusted from minimum value of device scale to maximum set value parameter [SuH]

SuH **Maximum Set Value Parameter (Default = Input Type Maximum Scale)**
Set value can not be greater than this value.
This parameter value can be adjusted from minimum set value parameter [SuL] to maximum value of the device scale

oFt **Process Offset Parameter (Default = 0)**
From -100 to 100°C for TC Type devices,
From -100 to 100°C for PT-100 (-50°C , 400°C) and PT-1000 (-50°C , 400°C),
From -10.0 to 10.0°C for PT-100 (-19.9°C, 99.9°C) and PT-1000 (-19.9°C, 99.9°C),
From -20 to 20°C for PTC (-50°C, 150°C) and NTC (-50°C, 100°C),
From -10.0 to 10.0°C for PTC (-19.9°C, 99.9°C) and NTC (-19.9°C, 99.9°C)

PHd **Temperature Control Delay at Power On (Default = 0)**
It can be adjusted from 0 to 99 minutes.

Ht1 **Cooking Time (Timer) Parameter (Default = 45)**
It can be adjusted from 1 to 999 minutes. When it is 1, [---] can be observed by pressing decrement button on the display. So Manual Control is selected. In Manual control, user can start and stop temperature controlling with cooking ON/OFF button or cooking time start/stop input.

PHS **Selection of Temperature Control and Starting Cooking Time (Timer) Parameter (Default = 0)**

[0] Temperature control and cooking time (Timer) starts at power on

[1] Temperature control starts at power on. Cooking time (Timer) can be started by pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition.

[2] Temperature control and cooking time (Timer) can be started by pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition.

bon **Buzzer is Active During This Time (Default = [---])**
This parameter can be observed if buzzer function selection [buF] is ≥ 1.
It can be adjusted from 1 to 99 minutes. When this parameter is 1, if decrement button is pressed, [---] is observed. Then buzzer becomes active till buzzer silence button

Prt **Button Protection Parameter (Default = 0)**

[0] There is no protection

[1] Cooking time(Timer) can not be changed. Cooking ON/OFF operation is not performed.

[2] SET value can not be changed

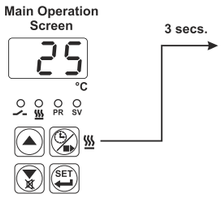
[3] Cooking time (Timer) and set value can not be changed. Cooking ON/OFF operation is not performed.

[4] Cooking time (Timer) and set value can not be changed. Cooking ON/OFF operation is performed when button is pressed.

PAS **Programming Mode Accessing Password (Default = 0)**
Password for entering to the programming mode is defined with this parameter.
It can be adjusted from 0 to 999. If it is 0, programming mode accessed without entering password.

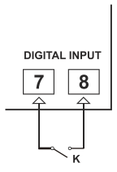
4.5 Cooking Time (Timer) ON/OFF Operation

4.5.1 Cooking Time (Timer) ON/OFF Operation with Cooking Button



In main operation screen, If cooking button is pressed for 3 seconds, then cooking time (Timer) is started and cooking time active led becomes active. While cooking time (Timer) continues if cooking button is pressed for 3 seconds, cooking time (Timer) is finished and cooking time active led lights off.
If button protection parameter [Prt] = 4 cooking time (Timer) ON/OFF operation is performed when button is pressed.

4.5.2 Cooking Time (Timer) ON/OFF Operation with Cooking Time Start/Stop Input



When K switch that is connected to the cooking time start/stop input, getting closed condition, cooking time (Timer) is started and cooking time active led becomes active. While cooking time (Timer) continues if K switch getting open condition, cooking time (Timer) is finished and cooking time active led lights off.

HtS **Cooking Time Starting Conditions Parameter (Default = 0)**
This parameter can be observed if cooking time (Timer) [Ht1] is ≥ 1.

[0] Cooking time (Timer) is started with cooking ON/OFF button or when cooking time start/stop input is getting closed condition.

[1] Cooking time (Timer) is started when temperature reaches to the process set value after pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition.

HCo **Temperature Controlling Continuity Selection Parameter (Default = 0)**
Temperature controlling can be continues or stopped according to the selection. This parameter can be observed if cooking time (Timer) [Ht1] is ≥ 1

[0] **Continuous Operation :** Temperature control starts after the temperature control starting delay at power on [PHd] is expired and continues. If buzzer function selection parameter [buF] Is 1 or 4, at the end of the cooking time, (Timer) internal buzzer operates to indicate cooking time has finished.

[1] **Interrupted Operation :** Temperature control starts after temperature control starting delay at power on [PHd] is expired. Temperature control can be stopped at the end of the cooking time (Timer) or by pressing cooking ON/OFF button or when cooking time start/stop input is getting open condition. Temperature control does not start till cooking ON/OFF button is pressed again or when cooking time start/stop input is getting closed condition again.

ALS **Temperature Alarm Function Selection Parameter (Default = 0)**

[0] Temperature Alarm function is inactive.

[1] Absolute alarm is selected. If temperature is lower than [AuL] and higher than [AuH] , then alarm is on.

[2] Relative alarm is selected. Alarm operates according to the set value. If temperature is below (Set - [AuL]) or above (Set + [AuH]) , alarm occurs.

AuL **Minimum Alarm Parameter (Default = Input Type Minimum Scale)**
It can be adjusted from minimum scale of the device to maximum alarm value (AuH).

AuH **Maximum Alarm Parameter (Default = Input Type Maximum Scale)**
It can be adjusted from minimum alarm value (AuL) to maximum scale of the device.

AdL **Alarm Delay Parameter (Default = 0)**
If an alarm occurs, delay can be defined with this parameter. It can be adjusted from 0 To 99 minutes.

APd **Alarm Delay After Power On Parameter (Default = 0)**
This parameter defines the delay for the alarm is being active after power on. It can be adjusted from 0 to 99 minutes.

buF **Buzzer Function Selection Parameter (Default = 1)**

[0] Buzzer is inactive.

[1] Buzzer is active at the end of the cooking time.

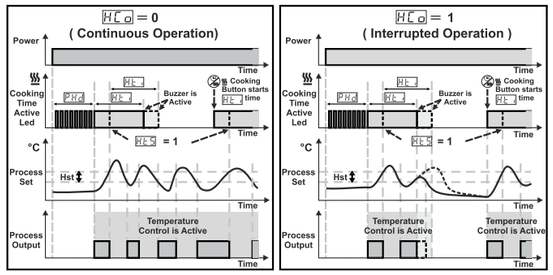
[2] Buzzer is active if an alarm occurs.

[3] Buzzer is active during sensor failures.

[4] Buzzer is active at the end of the cooking time, alarm or sensor failures.

4.6 Operation Graphics of Heating Controller

1- When cooking time parameter [Ht1] ≥ 1, if selection of temperature control and starting the cooking time parameter [PHS] = 0 (Temperature control and cooking time starts at power on) is selected;



2- When cooking time parameter [Ht1] ≥ 1, if selection of temperature control and starting the cooking time parameter [PHS] = 1 (Temperature control starts at power on. Cooking time (Timer) can be started by pressing cooking ON/OFF button or when cooking time start/stop input is getting closed condition) is selected;