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**Cookers**  
**GAS TIMER**



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# 1 - INTRODUCTION

## 1.1 - PURPOSE OF THIS MANUAL

The purpose of this manual is to provide basic information about the T-Zero electronic control applied to cooking hobs.

## 1.2 - ESD - ELECTROSTATIC DISCHARGES AND ITS EFFECT ON THE COMPONENTS

The interface for the control unit is not fitted with an internal device to protect against electrostatic discharge. When effecting repairs, therefore, the service engineer must check for stabilization of the potential on the oven casing (i.e. discharge any static electricity by touching the oven casing) in order to prevent the possibility of overload, which might damage the circuit boards.

The same care is necessary when handling circuit boards supplied as spare parts (i.e. not yet fitted to the appliance), which must be removed from the protective bag in ESD only after stabilizing the potential (i.e. discharging any static electricity) and only then installed in the appliance.

**Important:** The theory behind the process of electrostatic charge and discharge is not discussed in this Manual, since the tangible effects are considered to be more important. However, the effects are felt frequently when touching a metal handle and feeling the electrostatic discharge in the form of a minor shock. But what happens when stabilization of the potential takes place with semi-conductor components (i.e. components on a circuit board, such as integrated circuits, microprocessors etc.)?

Stabilization of the potential takes place across the internal structure of the semi-conductor component. This does not necessarily lead to the immediate destruction of the component; subsequent malfunctions across damaged internal connections may be more harmful, and these occur only as a result of overheating or current overloads.

It is true that almost all sensitive semi-conductor components (such as MOS circuits) have been improved by the addition of protective measures, but the internal structures of these components are today smaller than, for example, ten years ago, which tends to increase their sensitivity to the previous levels.

### **Important!**

Which components are susceptible to damage by static electricity during repairs?

All circuit boards with control and command accesses (door switches, food probes etc.), exposed connections and microprocessors, and other circuits with that can be freely accessed.

### **Examples:**

- Programming units connected to the food probe and the door switch
- Programming units whose processors are accessible (due to their high costs, the protective systems are only partially effective).
- W.O.E.C. control units
- S.O.E.C. control units
- C.H.E.C. control units
- KRONOS control units
- R.H.E.A. control units
- SOEC power board
- HOC2000 power board
- OVC1000 power board
- LEOC interface board.

## **2 - WHAT IS A GAS TIMER**

### **2.1 - INTRODUCTION**

The Gas Timer is an electronic programmer which, combined with a proper ignition generator, a transformer and special thermocouples, allows controlling the switching off of some gas burners in a safe way.

### **2.2 - DESCRIPTION**

The Gas Timer programmer is applied only on appliances featured with taps or gas thermostats with thermocouples.

This system consists of an electronic programmer which controls the tap magnets or the thermostat and a proper ignition generator, thus allowing programming the functioning of the gas burners of a cooker.

### **2.3 - GENERAL FEATURES**

The Gas Timer consists of an electronic programmer powered by a transformer and controls the switching off of the hob and oven burners through a release impulse of the magnets of the taps, once the set cooking time has expired.

The switching on and the operation during the cooking time is guaranteed by the taps with thermocouples and magnet combined with an ignition generator.

The tap magnet is always manually hooked, the operation of the ignition generator is detected by the programmer which performs also a safety function, sending to the selected tap magnet a signal of magnet release (switching off of the burner), when the set cooking time is expired or when the operation of the ignition generator is not detected.

The general features of this system are:

- Check of the oven gas burner through a 24h programmer.
- Switching off at the end of set cooking time through the buttons + or – for 5 loads. (4 hob burners and 1 oven burner).
- Single-hand operation by tapping duration keys (see Programmer use chapter).
- Maintain the system thermoelectric features (operation through the traditional thermocouples and taps with magnet).
- Planned for standard taps and thermocouples with programmer control.
- Detection of the operation of the external ignition generator.
- Safety system: control of switching off of the burners 3 hours after the last pressure of a knob or in case of an electric blackout.

## 2.4 - BASIC WIRING DIAGRAM

The system consists of various components, see Fig. 1.

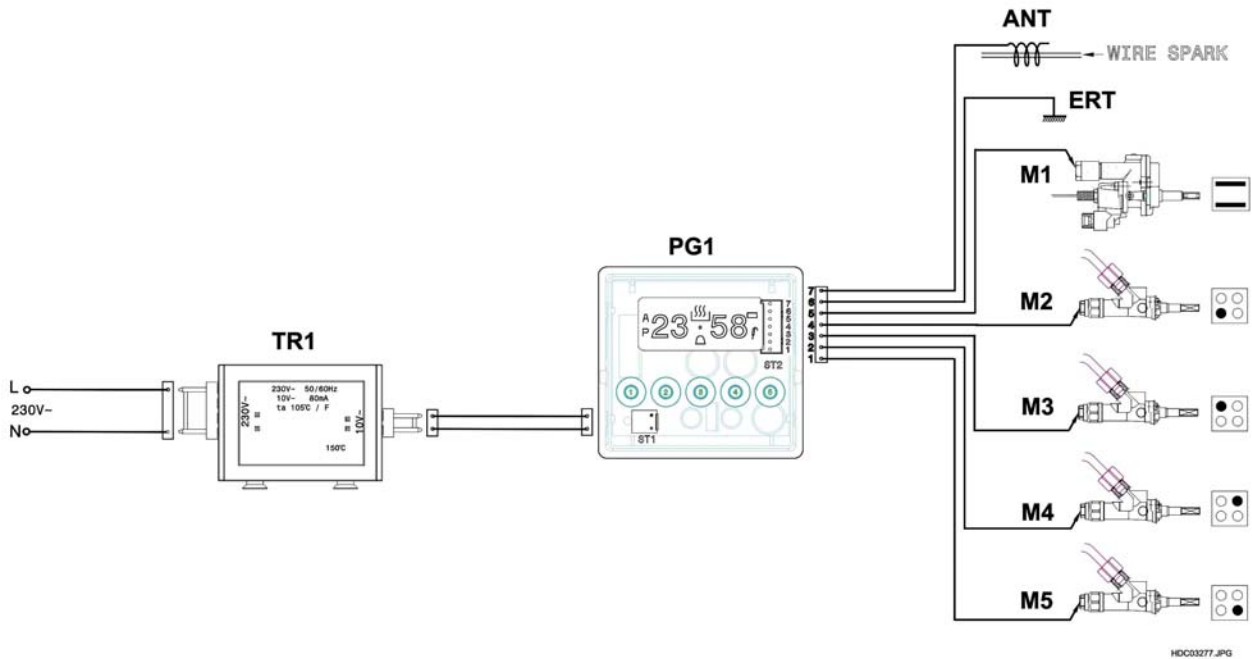


Fig. 1

- ANT - TURNS OF OPERATION DETECTION OF IGNITION GENERATOR
- ERT - EARTH CONNECTION TO GAS THERMOSTAT SUPPORT
- L - MAINS, PHASE
- N - MAINS, NEUTRAL
- M1 - MAGNET OF OVEN GAS THERMOSTAT
- M2 - MAGNET OF LEFT FRONT BURNER TAP
- M3 - MAGNET OF LEFT REAR BURNER TAP
- M4 - MAGNET OF RIGHT REAR BURNER TAP
- M5 - MAGNET OF RIGHT FRONT BURNER TAP
- WIRE SPARK - WIRE OF SPARK PLUG
- PG1 - END-OF-COOKING ELECTRONIC PROGRAMMER
- TR1 - PROGRAMMER TRANSFORMER

### 2.4.1 - EXAMPLE OF SYSTEM APPLICATION DIAGRAM

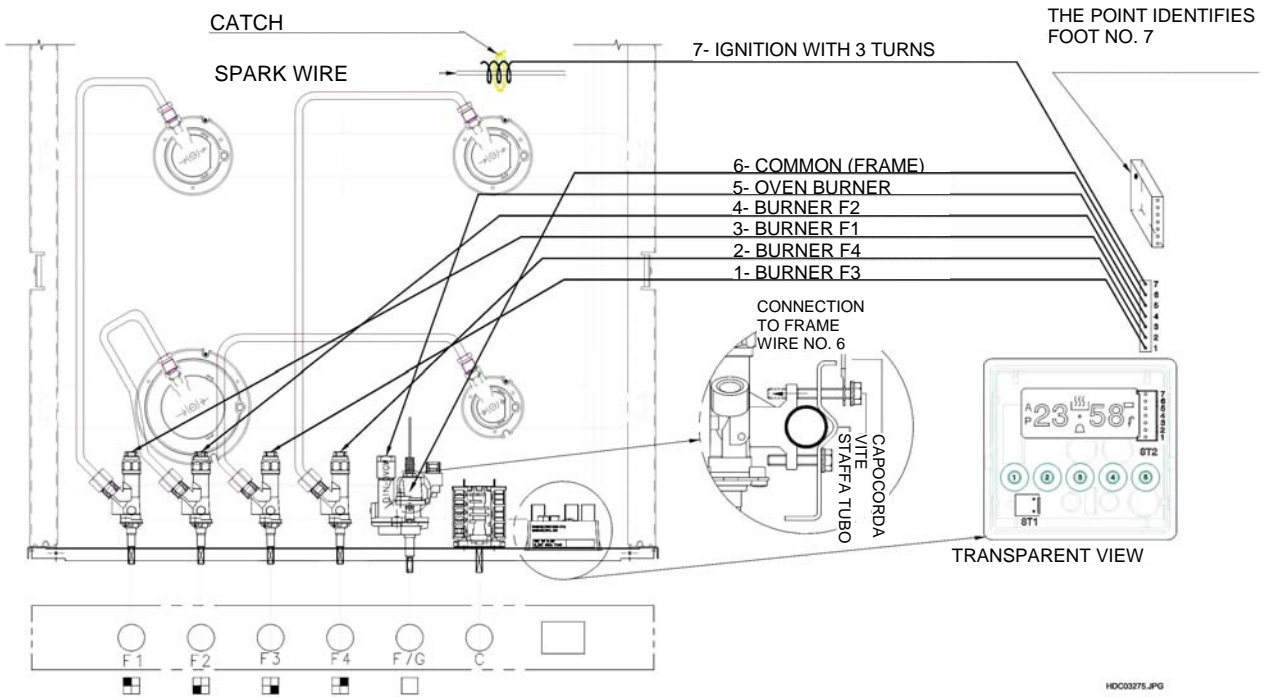


Fig. 2

### 2.5 - SYSTEM OPERATION

The Gas Timer programmer has the function to switch off the burner or the burners at the end of the set cooking time giving a release impulse to the magnets of the relative taps.

During the ignition phase and the normal operation, the Gas Timer programmer does not affect at all the operation as in a normal appliance with tap and thermocouple.

To control the magnets of the taps, the programmer uses some particular thermocouples with connection cables to the programmer (see Chapter 2.9 - THERMOCOUPLES AND CONTROL OF THE TAP MAGNETS).

## 2.6 - ELECTRONIC PROGRAMMER

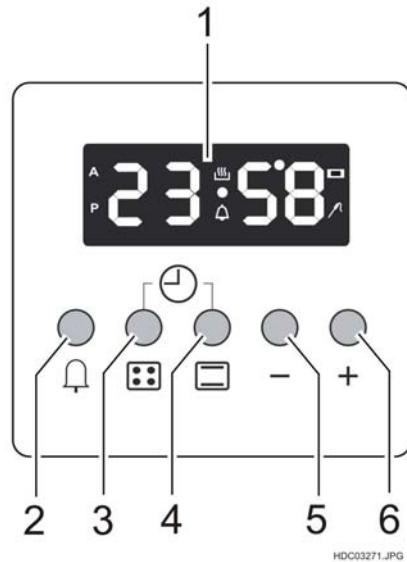


Fig. 3

- 1 - CLOCK / TIME DISPLAY
- 2 - MINUTE-MINDER BUTTON
- 3 - HOB BURNER PROGRAMMING BUTTON
- 4 - OVEN BURNER PROGRAMMING BUTTON
- 5 - CLOCK /TIME DECREASING BUTTON “-“
- 6 - CLOCK/TIME INCREASING BUTTON “+”

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### 2.6.1 - DISPLAY

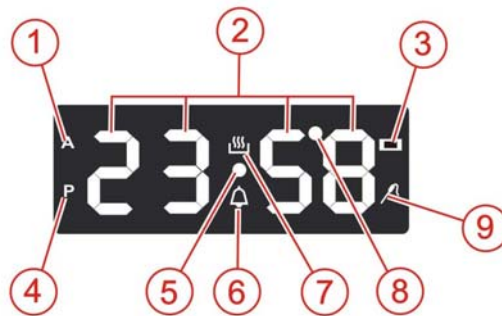


Fig. 4

- 1 - COOKING INDICATION SYMBOL WITH AUTOMATIC SWITCHING OFF OF HOB BURNERS
- 2 - CLOCK/TIME DIGIT DISPLAY
- 3 - COOKING INDICATION SYMBOL WITH AUTOMATIC SWITCHING OFF OF OVEN BURNER
- 4 - NOT USED (PROGRAMMATION SYMBOL)
- 5 - SECOND INDICATION
- 6 - MINUTE-MINDER SYMBOL
- 7 - NOT USED (AUTOMATIC COOKING)
- 8 - NOT USED (DECIMAL)
- 9 - NOT USED (MEAT PROBE SYMBOL)

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## 2.6.2 - ELECTRIC CONNECTIONS

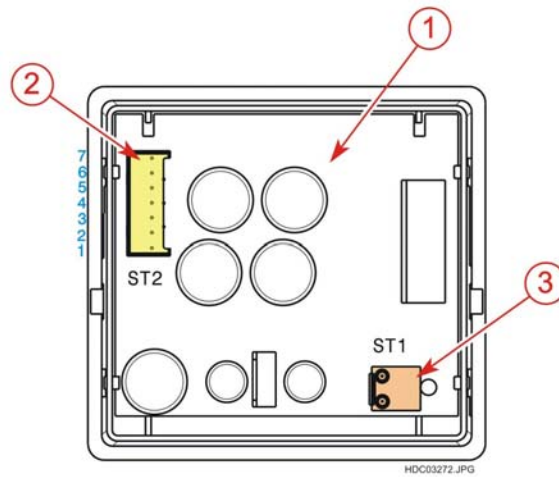


Fig. 4

- 1 - REAR VIEW PROGRAMMER
- 2 - CONNECTOR ST2 CONNECTION MAGNETS / IGNITION
- 3 - CONNECTOR ST1 SUPPLY AT 10V BY TRANSFORMER

The point on connector ST2 indicates the foot 7 (see Fig. 5).

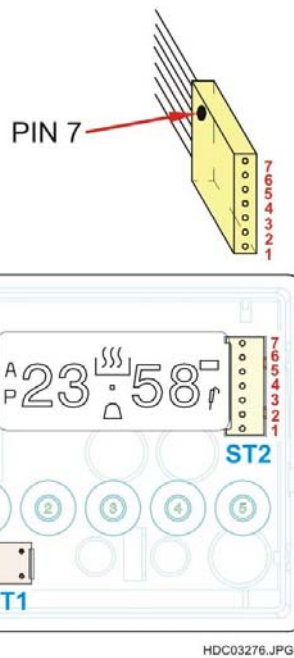


Fig. 5

### 2.6.3 - TECHNICAL FEATURES OF THE PROGRAMMER

Mains supply : 10 VAC (through the transformer at 230 VCA)  
Mains frequency : 50Hz  
Total power : 0,8 W

### 2.6.4 - PROGRAMMER TIMING

Clock : 24 hours  
Minute-minder, maximum time : 24 hours  
Maximum cooking time : 3 hours  
Magnet release pulse time : 0,5 seconds

### 2.6.5 - SAFETY SWITCHING OFF FUNCTION

The electronic programmer features a safety function which consists of a switching off pulse of the duration of about 0,5 seconds sent in sequence to all tap magnets of the burners after a maximum 3-hour operation time or in case of electric blackout. This pulse releases the magnets of the taps switching off the burners.

## 2.7 - POWER TRANSFORMER

The function of the transformer is to supply the power at 10 VCA to the electronic programmer. Figures 6 and 7 indicate the electric connections to the transformer.

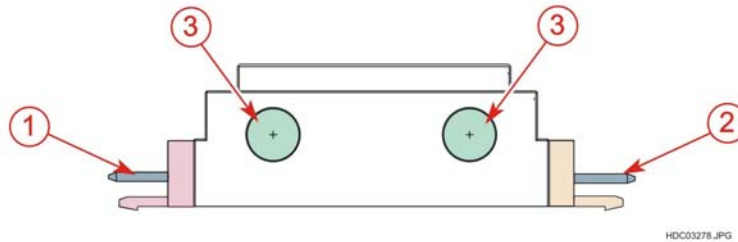


Fig. 6

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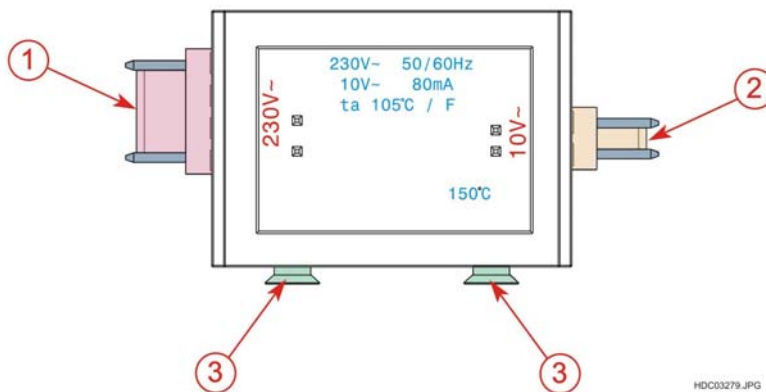


Fig. 7

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- 1 - MAINS SUPPLY CONNECTOR AT 230 V
- 2 - OUTPUT CONNECTOR AT 10V
- 3 - SUPPORTS FOR THE FIXING

## 2.8 - IGNITION GENERATOR

An ignition generator is used in this system. The ignition system and the activation procedure is the same as the one of a classic burner controlled by a tap with thermocouple and ignition through the spark plugs powered by the ignition generator.

### 2.8.1 - IGNITION DETECTION

The detection of the operation of the ignition generator occurs through a wire connected to the programmer and wrapped around the supply cable of the ignition spark plugs coming from the generator. During the ignition of the burners, an impulse is driven on the wrapped wire and come back to the programmer. This impulse is used to reset to zero the counter of the programmer safety system. The safety system consists of an impulse supplied to the tap magnets which releases the magnet switching off the burner 3 hours after the last ignition impulse.

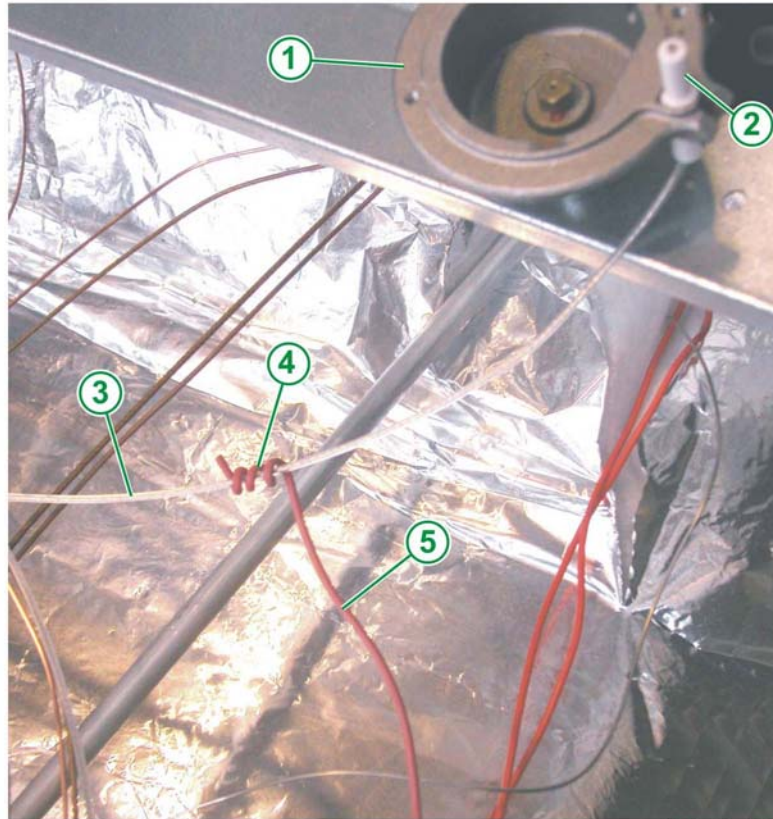


Fig. 8

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- 1 - GAS BURNER
- 2 - IGNITION SPARK PLUG
- 3 - IGNITION WIRE
- 4 - DETECTION THROUGH 3 TURNS
- 5 - DETECTION WIRE FROM PROGRAMMER

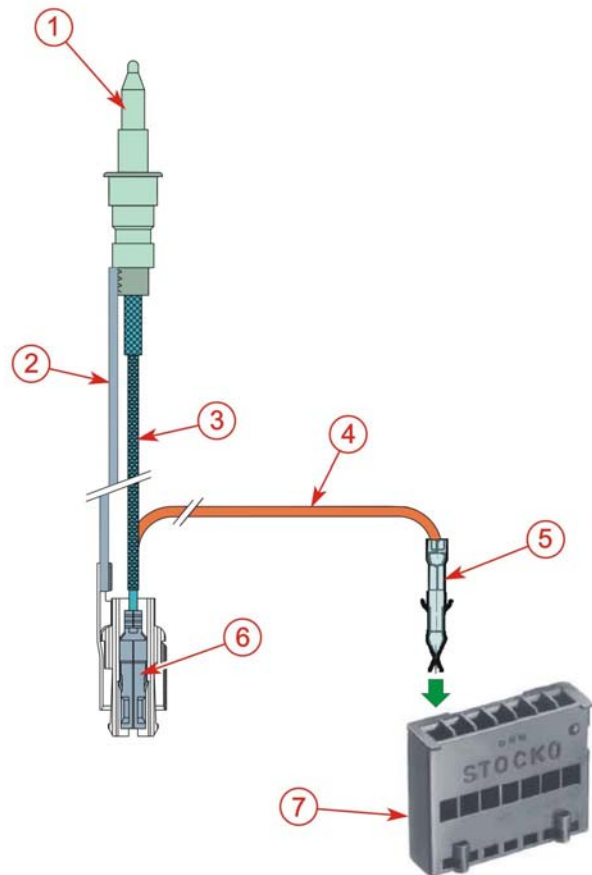
## 2.9 - THERMOCOUPLES AND CHECK OF THE TAPS MAGNETS

The thermocouples used with a Gas Timer are featured with a connection cable for the control of the tap magnet carried out by the electronic programmer through the connection connector (see Fig. 9).

Fig. 9

- 1 - THERMOCOUPLES
- 2 - EARTH CABLE FROM THERMOCOUPLE TO TAP MAGNET
- 3 - CONNECTION CABLE FROM THERMOCOUPLE TO TAP MAGNET
- 4 - CONNECTION CABLE FROM PROGRAMMER TO TAP MAGNET
- 5 - MAGNET CONTROL FOOT THROUGH ELECTRONIC PROGRAMMER
- 6 - THERMOCOUPLE CONNECTION AND ELECTRONIC PROGRAMMER TO TAP
- 7 - CONNECTION CONNECTOR TO ELECTRONIC PROGRAMMER

NOTE: In case of replacement of one of the thermocouples, it is necessary to extract the connection foot from the connector of the programmer, pressing the hooks using a small screwdriver to simplify the extraction.



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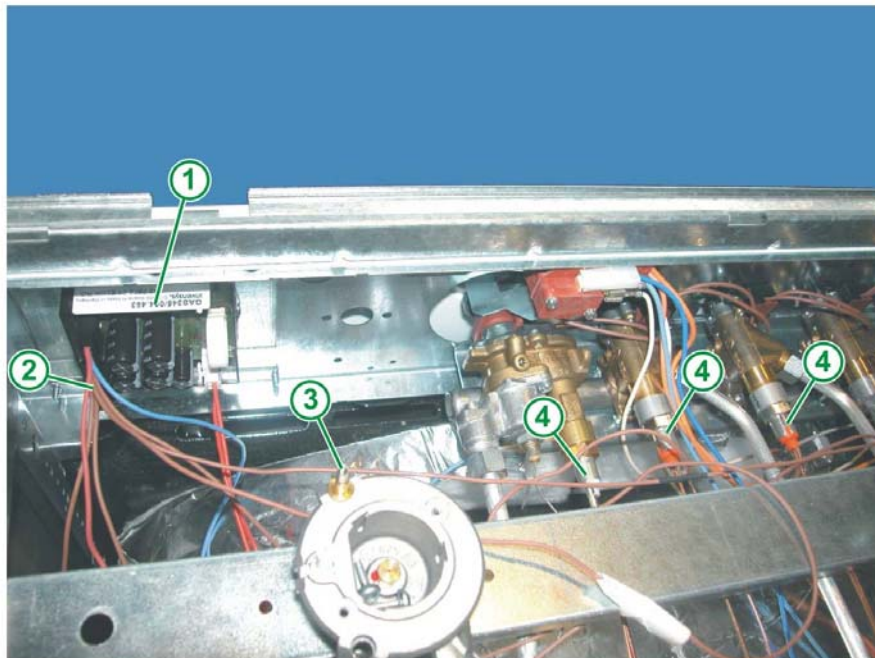


Fig. 10

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- 1 - ELECTRONIC PROGRAMMER
- 2 - CONTROL CABLES FOR THE TAP MAGNETS
- 3 - THERMOCOUPLES
- 4 - TAP MAGNETS

### 3 - USE OF THE PROGRAMMER



In the appliances featuring the Gas Timer programmer, if the appliance is disconnected from the mains or in case of mains fluctuations, the gas burners will switch off.

In case of power failure, the burners could be activated manually, but when the supply is reset, they will be switched off by the impulse given by the programmer when it is powered.

To set a programming time, it is necessary to set before the time of the day.

#### 3.1 - SETTING THE TIME OF THE DAY

To set the time of the day:

1. Push buttons  and  at the same time, till the central point flashes.

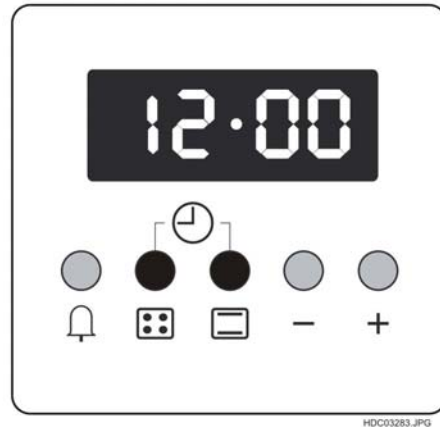






Fig. 11

2. Regulate the time of the day pushing button  or .

NOTE: If button  or  is hold down, the increasing or decreasing speed speeds up.

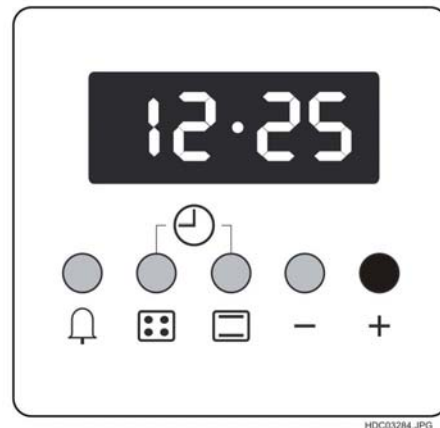



Fig. 12

### 3.2 - MINUTE-MINDER

The minute-minder operates independently from the cooking programming. At the end of the set time, the programmer emits an acoustic signal.

To activate the minute-minder:

1. Push button  till the corresponding symbol lights up on the display (see Fig. 13).

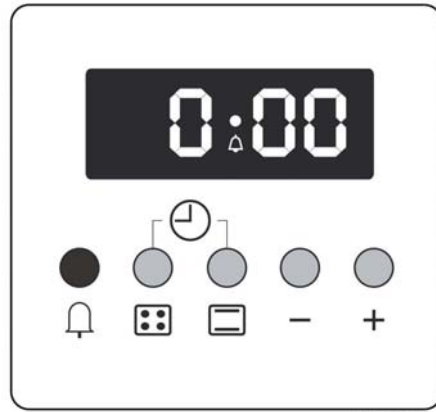






Fig. 13

2. Regulate the minute-minder time pushing button  or .

NOTE: If button  or  is hold down, the increasing or decreasing speed speeds up.

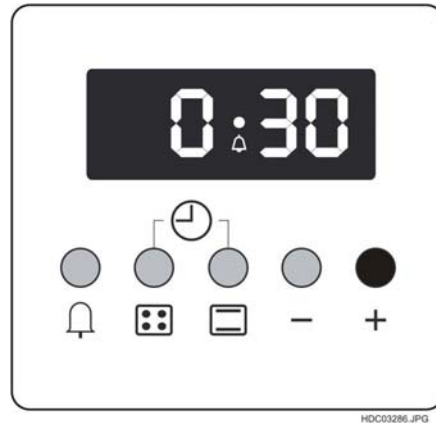


Fig. 14

### 3.3 - BUZZER

The programmer buzzer emits an acoustic signal when the set cooking time reaches zero. The acoustic signal can be switched off pushing any button, or switches off automatically after 5 seconds. The operation intervals of the buzzer are indicated in Fig.15.

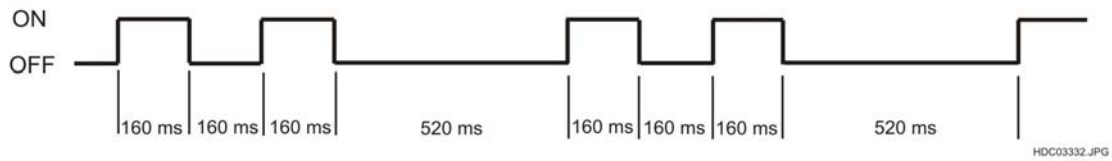


Fig. 15

In setting mode of the time of the day (when the point is flashing), it is possible to change the sound frequency emitted pushing button . The options are: 1,5 kHz , 2 kHz or 3 kHz

### 3.4 - SEMI-AUTOMATIC PROGRAMME WITH COOKING DURATION TIME

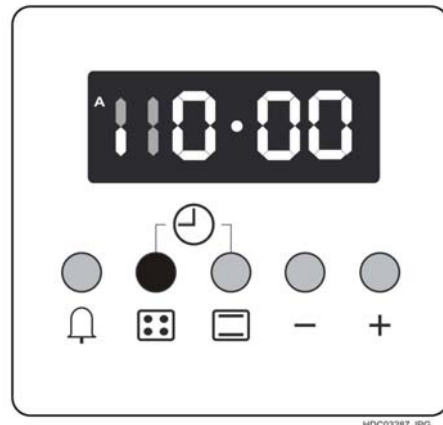
Through the Gas Timer programmer it is possible to programme the switching off of the hob and oven burners activating the relative programmes with button for the hob burners and button for the oven burner.

#### 3.4.1 - SEMI-AUTOMATIC PROGRAMME FOR HOB BURNERS

To set a cooking time for the hob burners:

1. Push button to select the burner.  
The selected burner is indicated by the segment relative to the burner position on the hob. Pushing button repeatedly, select the desired burner. The setting mode is indicated by the flashing of the segment relative to the burner and of symbol **A**.

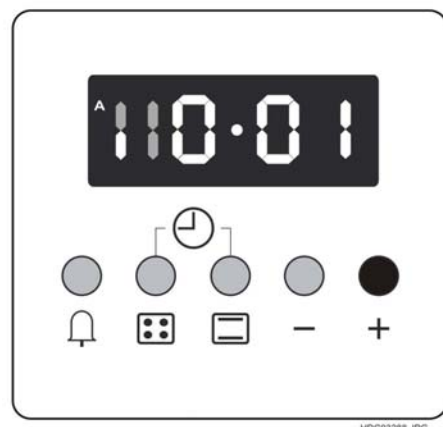
Fig. 16





2. Regulate the burner cooking duration time selected through buttons or .

If a cooking duration time has been set for another burner, the segment relative to the burner will remain lit.

Fig. 17



### 3.4.2 - SEMI-AUTOMATIC PROGRAMME FOR OVEN BURNER

1. Push button  to select the oven burner, the selection is indicated by the flashing symbol relative to the oven .

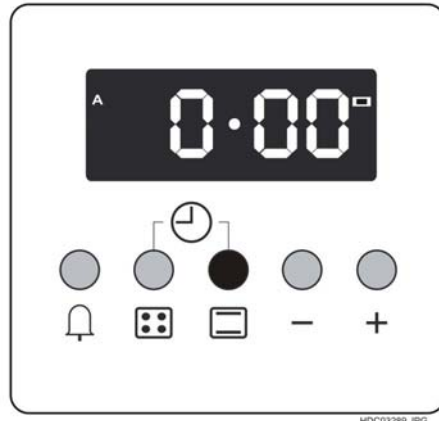





Fig. 18

2. Regulate the burner cooking duration time through buttons  or .

During the operation of the semi-automatic programme, the symbols **A** and  are lit constantly.

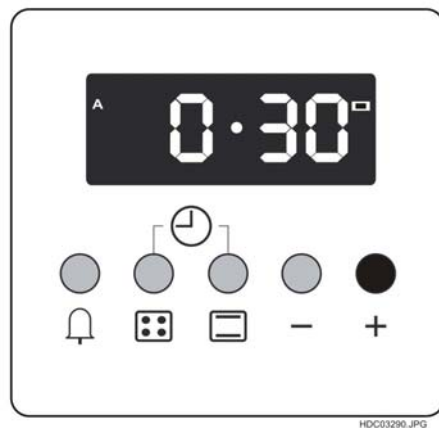



Fig. 19

### 3.6 - END OF SEMI-AUTOMATIC PROGRAMME

When the set time terminates, an acoustic signal appears and the relative indicator remains lit for 5 seconds more, this to indicate that the programme has terminated.

If no time is set for any burner, the symbol **A** remains off.

For the oven burner, besides symbol **A** also symbol  remains off.

NOTE: Even if all cooking times are set at the same level, the exits from the programmer for the switching off of the burners will activate in sequence with about a 5-second interval. The burners will switch off with about a 5-second delay.



## **4 - TROUBLESHOOTING**

Please find below some useful indications for some cases of malfunctioning regarding the Gas Timer or relative components.

### **4.1 - SWITCHING ON OPERATION**

During the troubleshooting procedure, it is important to take into consideration that the operation of the appliance featured with a Gas timer at the switching on is the same as the one of an appliance with a traditional hob with taps, thermocouples and switching on with generator.

### **4.2 - PROGRAMMED SWITCHING OFF**

If the burner does not switch off at the programmed time, the causes may be:

- Connection wire between magnet and Gas Timer programmer interrupted or with false contacts.
- Gas Timer programmer faulty.
- The auto-switching off timer of 3 hours does not reset (see Chapter "SAFETY SWITCHING OFF").

### **4.3 - SAFETY SWITCHING OFF**

If the auto-switching off does not occur after 3 hours of operation, the causes may be:

- Wire wrapped around the spark plug cable in a not correct way or interrupted.  
(see Chapter "2.8.1 – IGNITION DETECTION").
- There is no discharge on the spark plug which the wire - coming from the Gas Timer programmer - is wrapped around, due to faulty spark plug cable or ignition generator.
- Faulty Gas Timer programmer.

## 4.4 - FUNCTIONAL TEST OF THE PROGRAMMER

### 4.4.1 - ACTIVATION OF FUNCTIONAL TEST OF THE PROGRAMMER



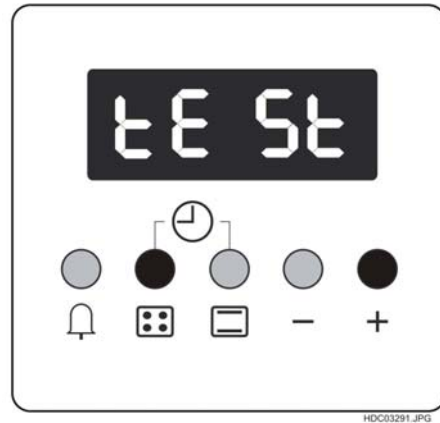
It is possible to access the special test function of the programmer within 10 seconds from the powering of the programmer.  
To activate this function push simultaneously buttons  and  immediately after the supply to the appliance till "tEst" appears on the display.

Fig. 20



### 4.4.2 - SWITCHING ON TEST OF DISPLAY SEGMENTS


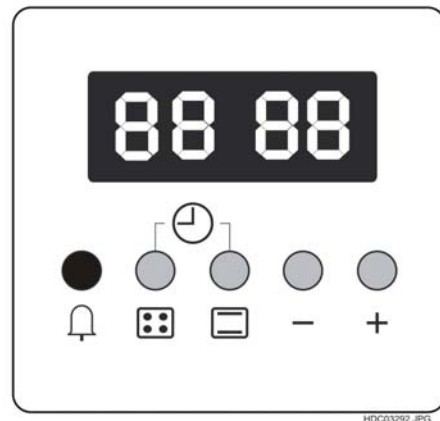
Pushing button  all the display segments light up.

Fig. 21



### 4.4.3 - SWITCHING OFF TEST OF DISPLAY SEGMENTS


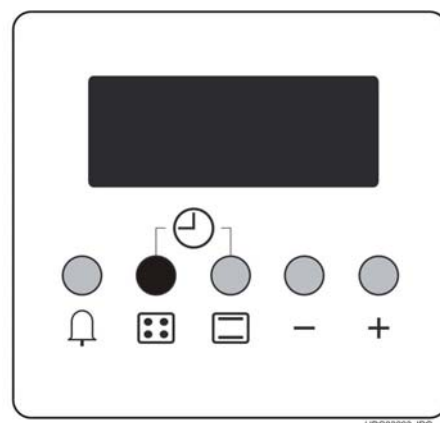
Pushing button  all the display segments switch off.

Fig. 22



#### 4.4.4 - SWITCHING ON TEST OF DISPLAY SYMBOLS


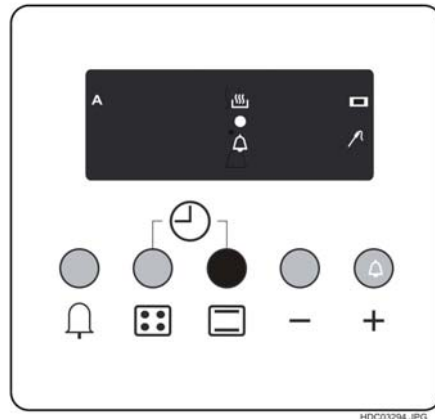
Pushing button  all display symbols light up.

Fig. 23



#### 4.4.5 - SWITCHING ON TEST OF DISPLAY UPPER PART SEGMENTS


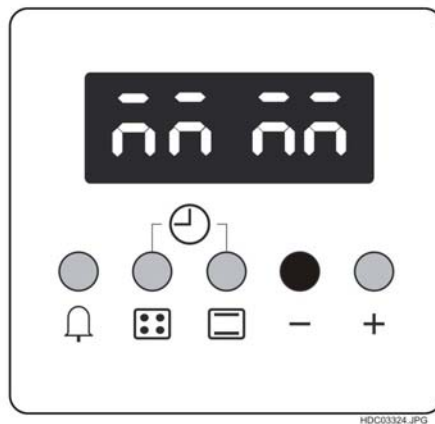
Pushing button  a part of the segments of the display will switch on (see Fig. 24).

Fig. 24



#### 4.4.6 - SWITCHING ON TEST OF DISPLAY LOWER PART SEGMENTS


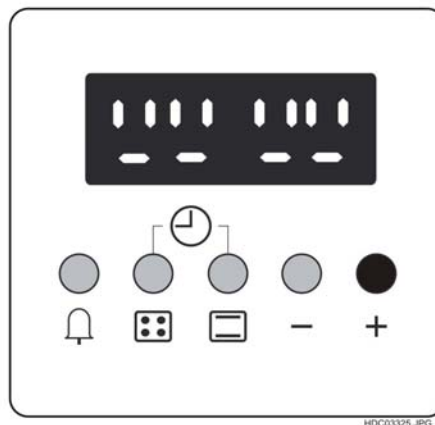
Pushing button  a part of the segments of the display will switch on (see Fig. 25).

Fig. 25



#### 4.4.7 - DISPLAYING THE SOFTWARE EDITION NUMBER



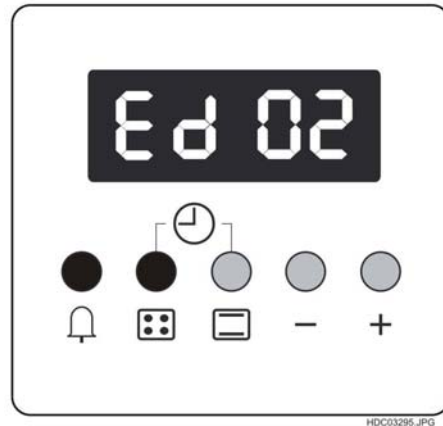
Pushing buttons  and  simultaneously, it will be possible to display the software edition number inserted in the programmer.

Fig. 26



#### 4.4.8 - DISPLAYING THE PROGRAMME NUMBER



Pushing buttons  and  simultaneously, it will be possible to display the programme number inserted in the programmer.

Fig. 27

