

## **Introduction.**


This computer has been developed by **TOMA** in collaboration with a Dutch electronics company. In so doing the latest technologies have been utilised, and consideration has been given to user-friendliness and functionality.


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The TOMA black box is built in accordance with stringent European safety requirements and bears a **CE** mark.

## **Safety warnings.**

**All items in these operating instructions indicated with the  symbol are safety warnings. Always follow these instructions.**

 Keep packaging material out of reach of children.

 This computer comprises advanced electronics, consequently it is never possible to repair it oneself. If the computer is not functioning properly, arrange for your supplier to inspect it.

We will be pleased to assist you if you have any queries or problems.

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**TOMA** wishes you every success with your control computer.

## 1.0 The keyboard and the displays.

Twenty-one keys are located at the front of the computer, a brief description of which is set out here, from top to bottom.

<b>Time</b>	Key for firing up or switching a program, a maximum of 99 hours and 59 min.
<b>Temp.</b>	Key for the temperature of a program, by default the maximum programmable temperature is set at 1320 ° C.
<b>P</b>	Program selection.
<b>Clear</b>	Clear a digit or program.
<b>Pause</b>	Interrupt a program.
<b>2</b>	Increase.
<b>2</b>	Decrease.
<b>Delay start</b>	Postponed start.
<b>0 to 9</b>	Digits for entering temperature and time or a program number.
<b>Start</b>	Start program.
<b>Stop</b>	Stop program.
<b>On/Off (5)</b>	Switch the computer on and off.
<b>Display (1)</b>	Display 1 consists of three segments.  The first two digits specify the program number (from 00 up to and including 19). The third digit indicates the step from 0 to 9.  During the baking process you can see at the point between two and three whether the oven is actually heating up.
<b>Display (2)</b>	Display 2 consists of 4 segments.  This indicates the temperature in °C or the time in hours and minutes.
<b>Light (3)</b>	Indicates that display 2 is indicating the Time.
<b>Light (4)</b>	Indicates that display 2 is indicating the Temperature.

## 2.0 Fixed programs.

The **TOMA Black Box** has 10 fixed programs, numbered 00 to 09.  
To use these proceed as follows:

- 1.) Switch on the computer using button 5.
- 2.) Press key **P**, the first digit will start flashing and the light in display 1 will be on.
- 3.) Always select program No. with two digits (**e.g. 2 = 0 2** )
- 4.) Press **start** and the program commences.

The program and the step number appear on display 1.  
Display 2 indicates the oven temperature.

### The fixed programs.

Prog	Temp1	Time1	Temp2	Time2	Temp3	Time3	Temp4	Time4
00	50	1.00	110	3.00	110	10.00		
01	750	2.00	750	0.30	550	1.30		
02	650	11.00	950	1.30	750	1.30		
03	650	5.45	950	1.30	750	1.30		
04	650	4.30	1020	1.50	1020	0.30	820	1.30
05	650	4.30	1050	2.00	1050	0.30	850	1.30
06	650	4.30	1080	2.15	1080	0.30	880	1.30
07	650	4.30	1120	2.30	1120	0.30	920	1.30
08	650	4.30	1240	2.50	1240	0.30	1040	1.30
09	650	4.30	1260	3.00	1260	0.30	1060	1.30

Time in hours and minutes.  
Temperature in °C.

P **00** is for drying.  
P **01** is for glazing, for instance  
P **02** is a slow and **03** a normal biscuit program.  
P **04 - 09** are glazing programs.

If required, fixed programs can be adapted by **TOMA** according to your wishes.

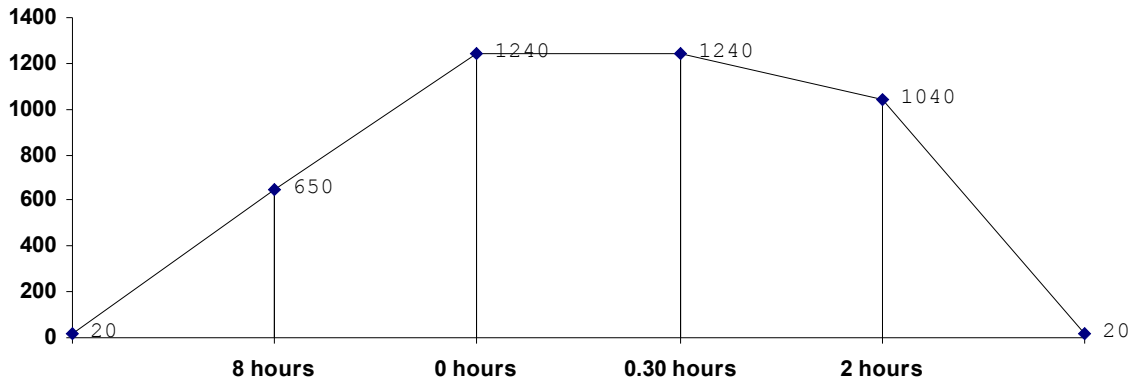
The programs are adapted for use with ovens with a lower final temperature.

### 3.0 Free programs

Programs 10 to 19 are empty; you can store your programs in these. These 10 programs can consist of 9 steps. During programming the data is stored directly in the memory.

#### Programming.

A step by step description is given on what must be done to create the program illustrated below.



For this program illustrated in this graph, in step 1 the temperature goes:  
in 8 hours to 650 °C then to step 2:  
in 0 hours to 1240 °C which in step 3 we:  
switch for 30 minutes and in the cool-down phase step 4:  
in 2 hours to 1080 °C

After which the oven continues to cool down at its own rate.

We are going to introduce these values under program number 10.

- 1.) Switch on the computer using button 5.
- 2.) Press key P, now the first digit, and the light in display 1, start to flash.
- 3.) Select program number: In this case No. 10, press 1 0 and **start**

The oven temperature appears on display 2, on display 1 the program number 10 and a horizontal dash will be shown.

If the selected program was not meant to be empty, and the program in question starts, you should press **stop** and select another number or clear the whole program. (see clear)

Now the values can be entered, we start with **Temp** (the order of **Time** - **Temp**. may be the other way round.)

Press **Temp.** ( the first digit in display 2 starts to flash and light 4 is on ) then **0 6 5 0**.

Inputting takes place as follows, first of all **thousands** then **hundreds** then **tens** and last of all **units**.

After **Temp.** we enter the time.

Press **Time** (light 3 is on ) then **0 8 : 0 0**.

With time first of all we take the hours, a maximum of **99**, then minutes, a maximum of **59**, this also has to be completed.

All four digits must always be entered, after entering the last number, the computer stores this in its memory.

For step 2 you press the 2 key.

Under step on display 1 the following appears: 2. Press **Temp.** and the digits **1 2 4 0**.

Then press **Time** and **0 0 : 0 0** , in step 2 the speed of the oven is maintained, so we take 0 hours/minutes. The computer will reach the temperature in this time and continues uninterrupted.

Continue with step 3 by pressing the 2 key, then press **Temp.** and the digits **1 2 4 0**. Then press the key **Time** and the digits **0 0 : 3 0**.

In step 3 we maintain the final temperature for 30 minutes (switching).

Continue with step 4, by pressing the 2 key, upon which it is cooled down a little bit more slowly. Then press **Temp.** and the digits **1 0 4 0**. Next press the key **Time** and the digits **0 2 0 0**.

From now on this is program 10, starting it operates in the same way as for the fixed programs.

1.) Computer on using button 5.

2.) Press key **P**, the first digit and the light in display 1 will flash.

3.) Always select program No. with two digits (**e.g. 10**)

4.) Press **start** and the program commences.

The program and step No. appear on display 1. Display 2 indicates the oven temperature. Using keys **Temp.** and **Time** you can change between the temperature and time designations.

#### 4.0 Correcting.

If you key in a value which is too high, when programming, the digit jumps to 0 and the next digit flashes, if you want to enter the previous position, then press **Clear** (the last digit starts flashing) and enter the correct value.

After the last digit has been entered you can not go back anymore by pressing **Clear**. Press **Time** or **Temp.**, depending on which you were entering.

Should you make a mistake during programming - for instance if you want to enter **1 2 4 0** but you press **1 2 5** - the **Clear** key should be press until the incorrect number is flashing. Subsequently, it can be corrected.

#### 4.1 Clearing programs.

After use, the program remains in the computer's memory, should this no longer be necessary, you can enter new values at each step or clear the whole program as desired. This is done as follows:

For instance, if you no longer need program 14, press key **P** (the first digit in display 1 will flash), then press **1** and **4**, a horizontal dash appears under step.

Now press **P** (the 1 will flash) and the **clear** key, and the program will be cleared. In this way, any link - if applicable - is undone, in the case of linked programs the first program has now been cleared. You must individually clear the following linked programs.

#### 4.2 Editing free programs.

It is also possible to change the data if a free program is no longer being used.

E.g. The set final temperature for program 10 is 1240, this is no longer used, but firing up/down is used.

Press key **p** and then **1** and **0**.

Now press key **2** to go to step 2, 1240 will appear in display 2.

Press key **Temp** and enter the desired temperature e.g. **1 2 6 0**.

Program 10 is now stored with the new temperature.

#### 4.3 Checking.

If during the baking process you wish to check the set temperature or time.

Press the number for the step No. that you want to check. E.g. program 6 is active, and you would like to know the temperature of step 2. Then press **Temp.** and then **2**, now the computer will indicate the set temperature on display 2. After 5 seconds the actual oven temperature will be shown again. When checking time, you should press **Time** and the step No. It is possible to check the steps together, one after another. This is done in the same way as described above, but after for example step 2 you immediately press **3** and then **4** etc.

**A check is only possible after the program has started.**

## 5.0 Postponed start.

Imagine you load the oven and do not want it to start the baking process until in the evening. Now before starting press the key **Delay start** and enter the number of hours in which you want to start later.

E.g. you want to start program 04 at 23.30 and it is now 14.00.

Press **P**, **0 4** then **Delay start** and the first digit in display 2 will flash, then **0 9 : 3 0** and start. Now the computer will start program 04 at 23.30.

## 5.1 Stopping.

The program can be stopped by pressing the stop key, or alternatively by switching the computer off by pressing key 5.

The computer automatically stops after completing a program, after which **end** will appear on display 1. The oven temperature will remain indicated on display 2.

The computer always stops if an error occurs.

## 5.2 Energy costs.

To answer the often posed question "What's the power consumption of my oven?", the **TOMA** computer has a built-in hour meter for the time that the oven has been burning.

It calculates this as follows:


When the program is completed, **END** will appear on display 1 and the oven temperature will appear on display 2. If you press **time**, the effective firing time appears. After a few seconds this is replaced by the temperature.

You can calculate the costs using this information: e.g. the total firing time is 5.00 hours, the consumption of the oven is 9.9 kWh. (the consumption is stated on the rating plate) the energy costs 21 cents per kWh.

The sum is: **Consumption \* firing time \* kWh. price = energy costs.**

**The costs 9.9 \* 5.00 \* fl. 0.21 = fl. 10.40**

## 5.3 Protection.

 The computer can be protected against unauthorised use by other persons.

You do this as follows: switch on the computer with button 5, hold down the **Clear** key until the text **LOC** appears on display 2. The computer is now closed down, and shows the text **LOC** when pressing one of the keys. The computer can be subsequently released by holding down the **Clear** key until the text **UN LOC** appears on displays 1 and 2.

## 6.0 Linking programs.

The **TOMA** computer has 10 free programs with 9 steps. Now it would be possible that for your specific application that this is not enough. For this reason, the computer has a linking function.

For example, you have reached step 9 during entering program 11 and you need even more steps. Now press and hold the **2** key for approximately 5 seconds. Program number 12 will now appear on display 1, after which you can proceed by entering step 1 of program 12.

After the data has been entered, you must start the **first** of the linked programs. In this case press key **P** number **1 1** and start.

If required, you can link up to 10 programs with one another in this way, therefore making a program with 90 steps.

Unlink see **clear program**.

### 6.1 Pausing

**A)** Editing free programs during the baking process.

When you would like change something in the free programs during the baking process, you should press **pause**.

Search for the desired step using the keys **2** and **2** .

Press **Temp** or **Time** and make the changes.

Then restart.

Editing using the **stop** key means that the baking process recommences from step 1. Using the **pause** key the program continues from the point at which it was interrupted.

**B)** Setting temperature during the baking process.

The TOMA Black Box enables you to maintain a certain temperature during the process.

If for instance the oven temperature is 100° C and a great deal of steam is still being produced, you should set the oven to 100° C for a time.

Press the **pause** key, light 3 or 4 starts to flash.

Press the **Delay start** key and subsequently enter the desired time e.g. 2 hours **0 2 : 0 0**.

**Pau** appears in display 1, and the time in display 2. After the 2 hours have elapsed, the computer continues with the program.

The computer maintains the temperature from the time of setting, this can be at any temperature during the baking process.

### 6.2 Skipping a step.

If you decide during the baking process that the current step is no longer necessary, you can skip it without interrupting the program. To do this you should press and hold the **2** key for approximately 5 seconds. The computer jumps to the next step and proceeds with this. This function works with the fixed and free programs.




## 7.0 Error messages.

When the computer detects a fault, the program is stopped, and lines start to move on display 2 and a number appears on display 1, this can be:

- E 01** Thermocouple interrupted or not connected, this error situation must exist for 10 seconds.
- E 02** Thermocouple installed incorrectly, this error situation must exist for 10 seconds.
- E 03** Heating element broken or a phase is missing (fuse blown), this error is detected based on a temperature measurement, if in a quarter, for 100% drive there is no temp. increase of a minimum of 4° C, this error message will be displayed.
- E 04** Protection is activated, the oven temperature has exceeded the set value by 20° C, always contact your vendor or manufacturer when this situation occurs.
- E 10** Computer error.
- E 11** NTC (cold joint ) short-circuited.
- E 12** NTC (cold joint ) interrupted

By pressing the **Clear** key, the error message disappears, the computer resumes the program that was active before the error occurred.

The error message will be displayed again if the error has not disappeared. When the error situation has been corrected, press start.

 Usually, an error message has a cause, e.g. a fault in the oven or computer. Please contact your dealer to investigate and repair the problem before continuing.

## 7.1 Maximum protection.

The TOMA Black Box is fitted with an extra safety circuit.

This means that in case of mechanical problems the computer is still switched off by an additional circuit if the highest set temperature is exceeded. (The safety circuit should also be included in the oven).

**The temperature at which the safety mechanism is triggered is +20° C.**

## 8.0 Installation.

There are two brackets at the back of the computer, with which you can attach the computer to the wall, for example. The computer is connected to the oven by means of a connector. Insert this connector into the socket on the oven, and subsequently tighten the fastening ring.

ⓘ Make sure that the computer and the connecting lead are not jammed against or too close above the oven.

## 8.1 Power outage.

If during the baking process the power fails, the values are stored in the memory, and upon restoration of the power the program is resumed from the point it had reached.

## 8.2 Technical specifications.

Power supply : 230 V AC ( 10 % ) 50/60 Hz ( 0.4 % )

Protective devices : the printed circuit board is fitted with a safety fuse.

The control of the heating elements should be fused by the customer.

Maximum switching current : 3 A.

Ambient temperature : from 0 to + 60° C in the room in which the computer is installed.

## 8.3 Terminal connection:

pin:

1 Thermocouple + type S (Pt Rh Pt 10 %)

2 Thermocouple - type S (Pt Rh Pt 10 %)

3 Earth control cabinet

8 Input L1 230 volt

9 Input N 230 Volt

12 Output L solenoid switch (fuse)

13 Output N solenoid switch

14 Output N solenoid switch