" Instructions for Vacuum Oven Device"

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Vacuum Oven Device

Vacuum oven is one of the sterile equipment that is used in laboratory research, engineering and industries. Vacuum ovens are often used for delicate drying processes such as drying small parts or removing flammable solvents. Also, the low pressure environment minimizes oxidation during drying.

How to start the device

➢ Make sure the device is level.

➢ Check the input power cable of the device and make sure it is connected to the appropriate power grid.

➢ Devices that have PC-12 controllers must be connected to an earthed outlet.

➢ Make sure that the main fuse of the device is ON.

➢ Make sure there are no flammable materials and goods near the device.

➢ Use suitable equipment with high thermal safety while working with the device.

➢ 7. By turning on the device and putting it in STAND BY mode, ensure the correct operation of the equipment such as fans, controllers, microswitches, keys, etc.

➢ Do not touch any of the controller keys until the device is fully powered up and the LEDs, 7-Segs and writing AtrA Co text and the current temperature of the device are displayed.

➢ If one of the keys is pressed while the AtrA Co text is being written, the device will enter the initial settings, which are fully described in the description section of the main controller.

➢ Avoid opening and closing the door for no reason during the process in order to reduce heat loss and also prevent the depreciation of the device.

Function of keys

➢ **PROGRAM NO key**: This key is used to select the program number from 0 to 9 **(figure 1).**

➢ **PROGRAM EDIT key**: This key is used to view the values of parameters in the previously selected program and to edit and change them.

- **MANUAL MOD key**: With this key, temperature parameters related to manual control and some other parameters such as offset, initial delay time, and maximum output power can be set.

- **MODE DISPLAY (TIME END) key**: This key is used to display different display modes and also to enter a negative number in some parts, including the offset part.

- **CLEAR key**: This key is used to return to the previous step when editing the program and deleting the program.

- **STEP key**: With this key in program editing mode, you can go to the next step without changing the displayed parameter or saving it. Buzzer key: This key is used to activate and deactivate the beep sound of the keys.

- **START/STOP keys**: **START** This key is used to execute manual or programmable mode: **STOP**. This key is used to exit the editing stage or manual execution or program execution.

Figure 1. Keys of the vacuum oven

Definitions of keys

- **MANUAL MODE**: By pressing this key, the word ((ñAп)) MAN is displayed on the first screen and MODE MAN flashes. This key has four parameters, in the first parameter of which you can enter the

desired temperature for manual control, and after that, in order to save the entered number, the ENTER key must be pressed, in this case, after saving the entered temperature, the next parameter is OFST It is displayed that it is used to correct the thermocouple error. It should be noted that the number entered in the OFFSET parameter ((oFSt)) is added to the display temperature given through the thermocouple. To make the entered number negative, the key (Disp Mode) END Time is used. The next parameter is ((Many or π Anȳ)) which shows the maximum output applied in manual mode. The next parameter is ((dELY)) which is the delay time in the execution of the manual mode and the program is set here.

<u>Press the **MOD MAN** key or the Stop key again to exit these settings</u>.

➢ **2. (Display Mode) End time**: In normal mode, the first display shows the current temperature of the device and the other display shows the set temperature (point set). Each time the display mode key is pressed, the display mode changes. By pressing the key once, the first display will show the output value in percentage and the second display will show the number of the active program. By pressing this key again (third mode), if you are running the program, the first display will show the remaining time of the same step and the second display will show the remaining time. They show the remainder of the entire program, and if you are in the delay execution mode, the first display will show the term ((dLYt)) and the second display will display the remaining time.

Note: In the field of entering the OFFSET parameter ((oFFSet)), this key changes the sign of the number**.**

➢ **3. PROGRAM NO:** By pressing this key, the first display is turned off and the lower display shows the number of the active program and the corresponding LED flashes, in this case the number of the active program can be changed.

➢ **4. PROGRAM EDIT:** By pressing this key, in case of setting a password on the program, the user must first enter the password that the user has already set on the device, after entering the password, we enter the program editing. Each program has four slopes, three of which are increasing and the last

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slope is decreasing, and each slope includes two parts. The first part is the time to reach the temperature (Heat rate), the second part is the holding time at that temperature (Hold time).

- ➤ **5. START:** By pressing this key, the three LEDs related to Start, Mode Man and No Programmer will flash. If you want to run the manual mode, press the Mod Man key and if you want to run the program mode, press the No Programmer key. In this mode, Start and Mode Man or No Programmer LEDs remain lit and the system goes to manual or program execution mode.

- ➤ **6. CLEAR:** in program editing mode, with this key you can go to the previous step without changing the displayed parameter or saving it. And in normal mode, it deletes the active program. In this case, at one stage, the word del is written on the first screen and the number of the active program is written on the second screen, and in the next stage, the word 1 yes is written on the first screen and the word 2 no is written on the second screen. If we press the 1 key, the program is active and all the programs connected to it are deleted and the word Del is written on the displays, which are the number of the main program and the programs connected to it from the left.

- ➤ **7. Step:** With this key in program editing mode, you can go to the next step without changing the displayed parameter or saving it.

Important safety tips

During work, if you encounter any of the following cases, fix it according to the description.

- ➤ **TC-OPEN error** if you encounter such a message on the display, first check the thermocouple wire, the wire may be broken or loose at its connection point, otherwise the thermocouple is damaged and needs to be repaired or replaced.

- ➤ **TEMP** OVER error This message means that the device has exceeded its maximum working temperature that is locked in the thermostat, and this condition causes the contactor to be disconnected

and connected, and a "clicking" sound is heard from inside the electrical panel, the device turn it off and turn it on again, if this problem occurs again, turn off the device completely and remove it from the electrical circuit.

- ➤ **ALLOW NOT error** When programming the controller, be careful that the temperatures that are given to the program are ascending or descending (it must finish its work cycle in one step, which is either ascending or descending otherwise, with this error you face)

- ➤ **PRG USED error**, for example, if you run and save programs 0 and 1 one after the other, you can no longer run another program before program 1, because program 1 is serialized with program 0, in this case, with a PRG USED error you face.