FOUR E'S SCIENTIFIC

Operating Instructions

Dry Bath Incubator



Contents

Safety Instructions	**2**
Unpacking	**4**
Correct Use	**5**
Operation	**5**
Temperature Calibration	**7**
Error Code	**9**
Maintenance and Cleaning	**9**
Technical Data	**10**
Warranty	**11**

Safety Instructions

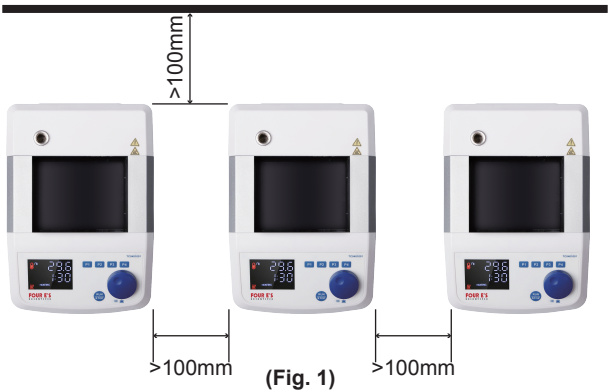
- Read the operating instructions in full before starting up and follow the safety instructions.
- Keep the operating instructions in a place where they can be accessed by everyone.
- Ensure that only trained staff work with the appliance.
- Follow the safety instructions, guidelines, occupational health and safety and accident prevention regulations.
- Socket must be earthed (protective ground contact).
- Before starting the device for the first time, ensure that the connector cable is suitable for the type of socket used and that a safe protective earth connection is assured.
- **Risk of burns!** Exercise caution when touching the housing parts and the heating plate. The heating plate can reach temperatures in excess of 120 °C. Pay attention to the residual heat after switching off. **The device may not be transported unless it is cold!**
- Don't operate the appliance in explosive atmospheres, with hazardous substances or under water.
- Set up the appliance in a spacious area on an even, stable, clean, non-slip, dry and fireproof surface.
- The base plate must be clean and intact.
- The voltage stated on the type plate must correspond to the mains voltage.
- The socket for the mains cord must be easily accessible.
- The power supply cable and cables to the external sensors must not be allowed to come into contact with the hot mounting plate.
- Check the appliance and accessories before hand for damage each time you use them. Do not use damaged components.
- **Caution!** Only media whose flashpoint lies above the safety temperature limit of 130 °C may be processed or heated with this device.

- Beware of hazards due to:
  - Flammable materials
  - Combustible media with a low boiling temperature
  - Incorrect container size
  - Overfilling of media
  - Unsafe condition of container.
- Only process media that will not react dangerously to the extra energy produced through processing. This also applies to any extra energy produced in other ways, e.g. through light irradiation.
- Bear in mind the possibility of contamination that might lead to undesirable chemical reactions.
- Wear your personal protective equipment in accordance with the hazard category of the media to be processed.
  Otherwise there is a risk from:
  - Splashing and evaporation of liquids
  - Ejection of parts
  - Release of toxic or combustible gases



- Immerse external temperature sensor PT 1000 at least 20 mm deep into the medium or insert the sensor into the hole provided for the purpose in the temperature control block.
- The external temperature sensor PT 1000 must always be inserted in the block / media when connected.
- Do not heat liquid media except with the block. Never pour liquid media directly on to the heating plate!
- Accessories must be securely attached to the machine and can’t come off by themselves.
- Always disconnect the plug before fitting accessories.
- Safe operation is only guaranteed with the accessories described in the “Accessories” chapter.
- The appliance must only be disconnected from the mains supply by pulling out the plug-in power supply unit.

To the protection of the equipment
- The appliance may only be opened by experts.
- Do not cover the device, even partially e.g. with metallic plates or film. This results in overheating.
- Protect the appliance and accessories from bumps and impacts.
- Ensure that the base plate is kept clean.
- Observe the minimum distances between the devices, between the device and the wall and above the assembly (min. 100 mm)



(Fig. 1)

Unpacking

Please unpack the device carefully and check it for damage. It is important that any transport damage is detected when the device is unpacked. If necessary, any inventory of the damage should be made immediately (postal service, railway, haulage company).

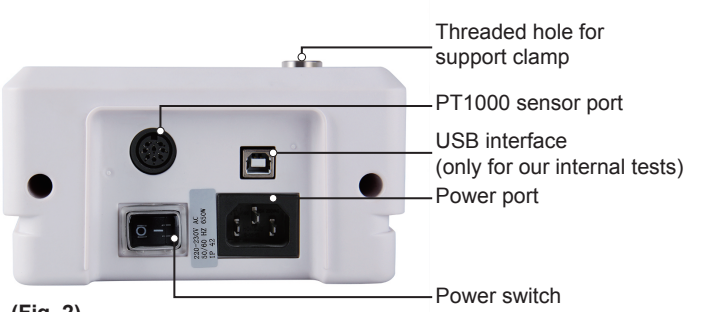
package contains:

Item	Qty.
Main Unit	1
Power cable	1
Thread handle	1
External temperature sensor PT1000	1
Operating instruction	1

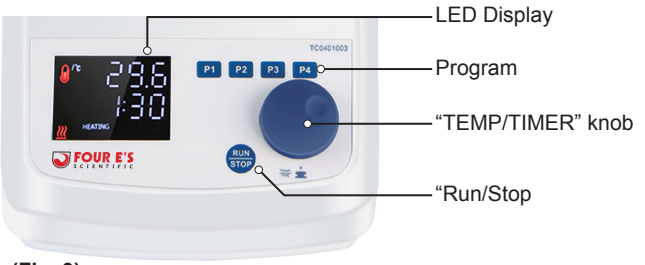
Correct Use

• Use
- For heating media in block heaters
• Range of use
- Laboratories, Schools, Pharmacies and universities

Operation



(Fig. 2)



(Fig. 3)

- **Temperature Setting**
  The temperature setting can only be workable when the machine is powered on but not when it’s working. Press the blue knob “TEMP/TIMER”; the temperature value on the LED display will flash, and then set the temperature by horizontal rotation of the knob.

- **Time Setting**
  The time setting can only be workable when the machine is powered on but not when it’s working. Press the blue knob “TEMP/TIMER” twice; the time value on the LED display will flash, and then set the time by horizontal rotation of the knob.

- **Switch between Fahrenheit Temperature and Celsius Temperature**
  Switch between the Fahrenheit Temperature and the Celsius Temperature by Pressing P1 and P2 simultaneously.

- **Program**

1. **Create a new program**
   The system can save 4 programs of the temperature and time. When the machine stops working, long press P1, P2, P3 or P4 to save the new data as P1, P2, P3 or P4 respectively.

2. **Program for quick operation**
   Short press P1, P2, P3 or P4 and the machine can work with the corresponding data (temperature and time) kept by the different programs. The user can also rotate the blue knob to choose the different programs.

• **Reservation Mode**
   Start and stop the reservation mode by pressing P1 and P3 simultaneously. In the reservation mode, the user can reserve the time for heating. After the appointment time is out, the machine starts to heat until the user stops heating. When stopping the reservation mode, the unit will start heating immediately by pressing “start” and the timing will work after the set temperature is reached. After the set time is out, the unit stops heating.

Temperature Calibration

Each single instrument is calibrated before shipment. If there is deviation between the actual temperature and the displayed temperature for some reasons, you can do as follow to calibrate the unit again.

1. Press P1 and P4 simultaneously and the system will be in the calibration mode. Without PT1000 connected, it’s internal probe calibration with CB01 displayed. With PT1000 connected, it could be CB02 or CB03 displayed. CB02 is for automatic calibration and CB03 is for manual external probe calibration. It’s the similar process for the internal probe calibration and the external probe calibration. It’s to calibrate the internal probe by internal probe calibration and calibrate the external probe by external probe calibration.
2. When PT1000 connected, switch between CB02 and CB03 by pressing the blue knob “TEMP/TIMER”. Only after the

external probe is calibrated (It's calibrated before shipment), the CB02 automatic calibration can work. In CB02 mode, there's no need for another thermometer and the calibration will start from 30°C to 90°C automatically in sequence by pressing "Run/Stop".

3. In the calibration mode, P1, P2, P3 and P4 is for the calibration point of 30°C, 50°C, 70°C and 90°C respectively. In automatic calibration mode, the calibration point is forced to start from 30°C.
4. Put high boiling point sample (above 100°C, for example: glycerin) into the block hole and then place a thermometer into the hole. (Make sure the precision of the thermometer should be within 0.1°C and the thermometer probe should be absolutely immersed into the sample). Make sure to put the thermometer into the hole which is in the middle of the block or closed to the middle hole.
5. Press "Run/Stop" and the system will be in "Heating" mode.
6. After about 30 minutes of the "Holding" mode, read the data from the thermometer. Press the blue knob"TEMP/TIMER" and adjust the temperature of the machine per the reading of the thermometer.
7. Press "Run/Stop" to save the calibration value, the system stop heating.
8. For external probe calibration, repeat the above steps to do the calibration of other calibration points.
   In automatic calibration mode, there're no above steps. The data will be saved automatically when self-calibration is completed.
9. Restart the machine after the calibration

Temperature Calibration

Item	Calibration Point	reading of the thermometer
1	30°C	
2	50°C	
3	70°C	
4	90°C	

Error code

If the unit cannot work properly with below faults, it will show the corresponding error code and beep for warning.

Item	Fault description	Fault code
1	External sensor short-circuit	E1
2	Internal sensor open circuit	E2
3	Internal sensor short-circuit	E3
4	External sensor isn't in the block	E4

Maintenance and Cleaning

The appliance is subject only to the natural wear and tear of components and their statistical failure rate. Use only cleansing agents which have been approved by us to clean our devices.

To remove use:

Dyes	isopropyl alcohol
Constructions materials	water containing tenside / isopropyl alcohol
Cosmetics	water containing tenside / isopropyl alcohol
Foodstuffs	water containing tenside
Fuels	water containing tenside

For materials which are not listed, please request information from us. Please disconnect the main plug and do not allow moisture to get into the appliance when cleaning. Wear the proper protective gloves during cleaning of the devices. Electrical devices may not be placed in the cleansing agent for the purpose of cleaning. Before using another then the recommended method for cleaning or decontamination, the user must ascertain with the manufacturer that this method does not destroy the instrument.

Technical Data

Model	**TC0401001**	**TC0401002**	**TC0401003**
Number of blocks	1	2	4
Heat output [W]	165	250	430
Heating temperature range [°C]	room temp. +5°-150	room temp. +5°-150	room temp. +5°-150
Temperature display	LED	LED	LED
Adjustment and display resolution [K]	0.1	0.1	0.1
Connection for ext. temperature sensor	DIN 12 878	DIN 12 878	DIN 12 878
PT 1000 variation; DIN EN 60751 Kl. A [K]	<= ± (0.15 +0.002xITI)	<= ± (0.15 +0.002xITI)	<= ± (0.15 +0.002xITI)
Temperature stability within the blocks<60°C * [±°C]	0.2	0.5	0.5
Temperature stability within the blocks> 60°C * [±°C]	0.2	1	1
Temperature Uniformity < 60°C * [K]	0.2	0.5	0.5
Temperature Uniformity > 60°C * [K]	0.2	0.5	1
Heating rate / Heat up time with external sensor * [K/min]	5	4.5	4

Model	TC0401001	TC0401002	TC0401003
Set-up plate material	Aluminium alloy	Aluminium alloy	Aluminium alloy
Set-up plate dimensions [mm]	96 x 76	96 x 152	96 x 304
Fixed safety circuit [°C]	180	180	180
Timer	yes	yes	yes
Time setting range	1 min - 99h59min	1 min - 99h59min	1 min - 99h59min
Dimensions (W x H x D) [mm]	152 x 86 x 190	152 x 86 x 300	152 x 86 x 465
Weight [kg]	1.5kg	2.5kg	7.5kg
Permissible ambient temperature [°C]	5 - 40	5 - 40	5 - 40
Permissible relative humidity [%]	80	80	80
Protection class according to DIN EN 60529	IP 21	IP 21	IP 21
Voltage [V]	220 - 240 / 115	220 - 240 / 115	220 - 240 / 115
Frequency [Hz]	50/60	50/60	50/60

Warranty

You have purchased an original laboratory machine which meets the highest engineering and quality standards. In accordance with our warranty conditions, the warranty period is 24 months . For claims under the warranty please contact your local dealer. You may also send the machine directly to our works, enclosing the delivery invoice and giving reasons for the claim. You will be liable for freight costs.