Benchmark Scientific

H2206-120 / H2206-250

myTEMP™

Heating and Cooling INCUBATORS

USER'S MANUAL

CE

Thank you for choosing Benchmark Scientific. Please read and keep this User Manual carefully.

Please retain the packing material until you see that the product is in good condition, and it is operating properly. If external or internal damage is observed, immediately report the damage to the transportation company.

While you are operating the device please;

1. follow the warning labels,
2. do not remove warning labels,
3. do not operate a damaged device,
4. do not operate the device with a damaged cable,
5. do not move the device during operation.

If you have a problem, please contact Benchmark Scientific.

The validity of the guarantee is subject to compliance with the instructions and precautions described in this manual.

Benchmark Scientific reserves the right to improve or change the design of its products without any obligation to modify previously manufactured products.

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BENCHMARK SCIENTIFIC
2600A Main St. Extension
Sayreville, NJ 08872

Tel : 908-769-5555
Fax : 908-222-1864
Email : info@benchmarkscientific.com

WARRANTY CONDITIONS

Benchmark Scientific, Inc (Benchmark) warrants all Equipment referenced below will conform to the applicable product specifications, will be manufactured, packaged and shipped in compliance with all applicable rules, regulations and standards, and in a manner to ensure its compliance with the specifications upon receipt, and will be free from defects in design, material or workmanship under normal use and service for a period of two (2) years from the date of delivery to customer. Customer will maintain records of this delivery. All repair covered by this warranty must be done at Benchmark's New Jersey facility, or other such warranty repair facilities of Benchmark as designated by Benchmark unless Benchmark specifically directs that this service be performed at another location. Any defect corrected within two (2) years and found to be within this scope of the warranty will be repaired by Benchmark and all charges for labor and material, will be borne by Benchmark. If it is determined that either no fault exists in Benchmark, or the damage to be repaired was caused by negligence of the customer, its agents, employees or customers, customer agrees to pay all charges associated with each such repair. THIS CONSTITUTES THE SOLE WARRANTY MADE BY BENCHMARK SCIENTIFIC, INC EITHER EXPRESSED OR IMPLIED. THERE ARE NO OTHER WARRANTIES EXPRESSED OR IMPLIED WHICH EXTEND BEYOND THE FACE HEREOF, HEREIN.

ISSUES TO CONSIDER REGARDING WARRANTY

The warranty provided by Benchmark Scientific does not cover the following situations:

1. Damages arising from the use of the device for purposes other than its normal intended use,

2. Damages resulting from exposure to substances with physical or chemical effects,

3. Damages and malfunctions that occur if the instructions in the user manual are not followed,

4. Damages caused by low or excessive voltage, faulty installation, or using the device at a voltage different from the one specified on the label.

5.Damages occurring during loading, unloading, and transportation for which the customer is responsible,

6. Invalidation in cases where the device has been disassembled or its functions altered by individuals other than authorized service personnel for various reasons.

☞ **BEFORE OPERATING THE DEVICE, THIS MANUAL MUST BE READ CAREFULLY.**

☞ **WARRANTY TERMS ARE VALID WHEN THE INSTRUCTIONS AND WARNINGS DESCRIBED IN THE DEVICE'S USER MANUAL ARE FOLLOWED.**

THE INFORMATION CONTAINED IN THIS MANUAL BELONGS TO BENCHMARK SCIENTIFIC. THE INFORMATION IN THE GUIDE CANNOT BE REPRODUCED OR DISTRIBUTED WITHOUT BENCHMARK SCIENTIFIC'S PERMISSION.

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I. INTRODUCTION

I.I. USE AND FUNCTION

H2206-120 and H2206-250 Heating and Cooling Incubators are designed for biology and microbiology laboratories. It is designed to provide high-level incubation conditions for drying, freezing, long-term storage purposes required by research and quality control laboratories in the pharmaceutical, food and cosmetic sectors, and in the field of biotechnology.

The heating/cooling incubators operate in temperature range between -10°C and 60°C and keeps the temperature stable within the given tolerances. MyTemp Series Heating and Cooling Incubators are safely operated via microprocessor control system. An adjustable safety thermostat offers additional safety for your operations.

Stable and homogeneous temperature in the useful volume is provided by means of the forced air circulation through the stainless-steel heater and the evaporator through which refrigerant circulates. The insulation not only provides a homogenous temperature distribution but also saves energy.

A well-insulated glass window and switchable LED interior lighting permit samples to be observed throughout the incubation process.

The H2206 Series have audible and visual alarm systems for open door more than 2 minutes, power failure, high and low temperature conditions, temperature sensor failure and other faults associated with the microprocessor control system. H2206 Series stores the last 50 failures in the memory and these errors can be followed on the display.

myTemp Series Heating and cooling Incubators have internal memory which can store temperature values for 10 years.

The myTemp Series Incubators are manufactured according to the following standards;
EN 61010-1, EN 61000-6-3, EN 50419.

This device is in compliance with WEEE Regulation.

If the warnings mentioned in this manual are not considered, Benchmark Scientific will not be responsible from their results.

2. TECHNICAL SPECIFICATIONS

2.1. TECHNICAL SPECIFICATIONS TABLE

TECHNICAL SPECIFICATIONS	H2206-120-E	H2206-250-E
Temperature Range	-10°C / +60°C	
Temperature Sensor	Pt-100	
Temperature Set and Reading Sensitivity	0.1°C	
Temperature Fluctuation (4°C / 22°C)	±1°C / ±0,5°C	
Timer	1 min – 100 hours / Hold position	
Number of Program and Step	20 / 20	
Safety System	Gas expansion safety thermostat (0 – 90°C)	
Defrost	Automatic	
Refrigerant	R290	
Power Supply	230 V / 50 Hz	
Number of Shelves (Standard/Max)	2/10	3/20
Power Rating	800 W	1250 W
Gross Volume (liter)	158	288
Net Volume (liter)	123	253
Internal Material	Stainless Steel	
External Material	Epoxy-polyester powder coated stainless steel	
Control System	Programmable Microprocessor Control System	
Temperature Indicator	Color LCD	
Internal Memory	10-year memory	
Chamber Dimensions (WxDxH) mm	510x553x770	510x553x1168
Internal Dimensions (WxDxH) (mm)	475x553x635	475x553x1033
External Dimensions (WxDxH) (mm)	615x805x1280	615x805x1852
Packes Dimensions (WxDxH) (mm)	785x855x1315	680x840x1900
Net/Packed Weight (kg)	103/119	135/163

2.2. ACCESSORIES

H2206-SH Shelf for H2206-120 and H2206-250, each
H2206-SHC Shelf Carrier for H2206-120 / H2206-250, each

☞ 2pcs. shelf carrier should be ordered for each shelf.

3. PRECAUTIONS AND LIMITATIONS ON USE

The user shall pay attention to the following:

- Do not use the device other than its intended use.
- The transportation, assembly, installation, initial operation, and maintenance of the device must be performed by personnel authorized and trained by the manufacturer.
- The device must be used by authorized and trained personnel after reading the operating instructions. In the event of a problem, only authorized technical service personnel should intervene with the device.
- Only spare parts and accessories provided by Benchmark Scientific should be used.

- The electrical line requirements must be suitable for the power of the device. The electrical line must always be grounded.
- The set temperature should not destroy the structure of the samples without user's notice.
- The boiling points of the samples should be higher than the set temperature.
- The freezing points of the samples should be lower than the set the temperature.
- The samples which may liquefy and expand should not be in a sealed container.
- Liquids which may expand during heating should not overflow from their containers.
- The safety thermostat should be adjusted to the temperature higher than the set temperature.
- There should not be any material in the chamber that can damage to the device.
- The materials which will be subject to heating or drying should not be combustible, explosive, heat susceptible, flammable, adhesive and fusible.
- Ensure that the vapors and gases generated during the operation are not harmful to human health and flammable or explosive.
- The environment where the device will be used must be open to the outside environment and have clean air.

4. SYMBOLS

SYMBOL	Description
	Symbol on the user manual: Attention, general danger. This symbol draws attention to safety-related warnings and potentially dangerous situations. Failure to follow these warnings may result in damage to the device and injury to users.
	Symbol on the instruction manual: This symbol draws attention to important situations.
	Symbol on the device label: This symbol indicates the manufacturer's information of the device.
	Symbol on the device label: This symbol indicates the date of manufacture of the device.
	Symbol on the device label: WEEE Do not throw away electrical and electronic equipment!
	Symbol on the device label: Before the appliance is operated, this manual must be read carefully.

Labels on the device:













Earthed Wall Socket

H2206-120 / H2206-250 Fuses (2 x 10A)

5. INSTALLATION

13.1. ENVIRONMENTAL CONDITIONS

The instrument is designed to operate safely under the following conditions:

- Indoor use only
- Ambient temperature: 5°C to 40°C
- Maximum relative humidity for temperature up to 31°C: 80%
- Maximum altitude: 2000 m
- Temperature for maximum performance: 15°C / 25°C

> ☞ The instrument is designed to operate in 20°C (±5°C) laboratory conditions. The efficiency of the unit decreases if the ambient temperature exceeds the limits.

13.2. HANDLING AND TRANSPORTATION

All handling and transportation must be carried out by using proper equipment and experienced staff. The instrument must be supported underneath and never be turned upside down.

13.3. UNPACKING

Remove the cardboard box packing and the second nylon wrapping around the instrument. Ensure that no damage occurred during transportation. The below mentioned are provided with the instrument, please check them;

- 1 ea. User manual
- 1 ea. power cable for H2206-120 and 252
- 2 ea. Shelves for H2206-120
- 3 ea. Shelves for H2206-250
- 4 ea. Shelf rails for each shelf
- 2 ea. keys for the door lock

13.4. MAINS SUPPLY

The instrument requires 110 V, 60 Hz.

Please make sure that the supplied mains match the required power ratings which are written on the name of plate of the instrument located at the back of the instrument.



Always plug-in the instrument to correctly grounded sockets.



A supply fitted with a circuit breaker should be used for protection against indirect contact in case of isolation fault.

13.5. POSITIONING

- Check that the positioning is suitable for users.
- Check that the device is stable on its four feet.
- Check that the positioning of the cooled incubator prevents interference with other equipment in the near surrounding.
- The ground where the instrument is positioned should be resistant to the weight of the instrument and vibration free.
- There should be enough space from the cooling unit ventilation. Leave at least 30 cm. free space between the equipment and wall.

13.6. GENERAL PRESENTATION

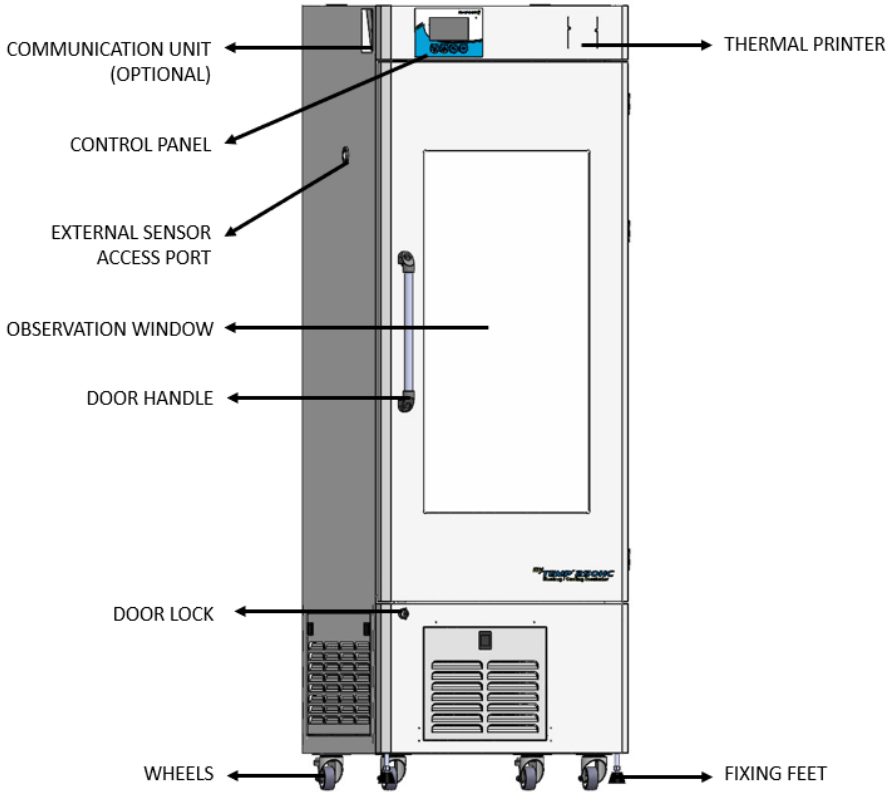


Figure 1 - Front View of H2206-250

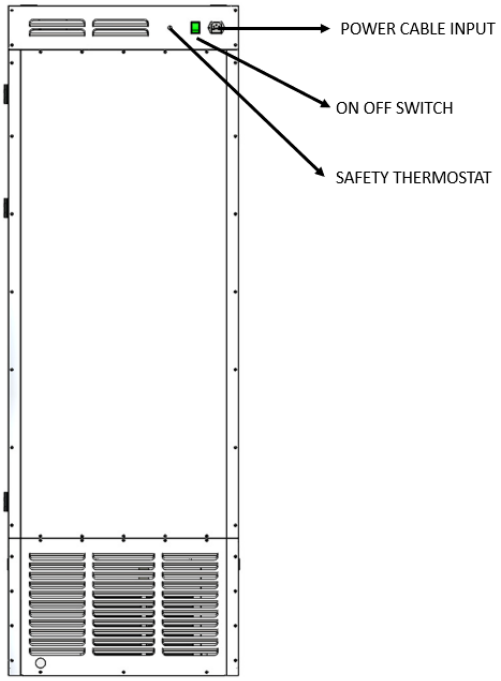


Figure 2 - Back View of H2206-250

13.7. CONTROL PANEL

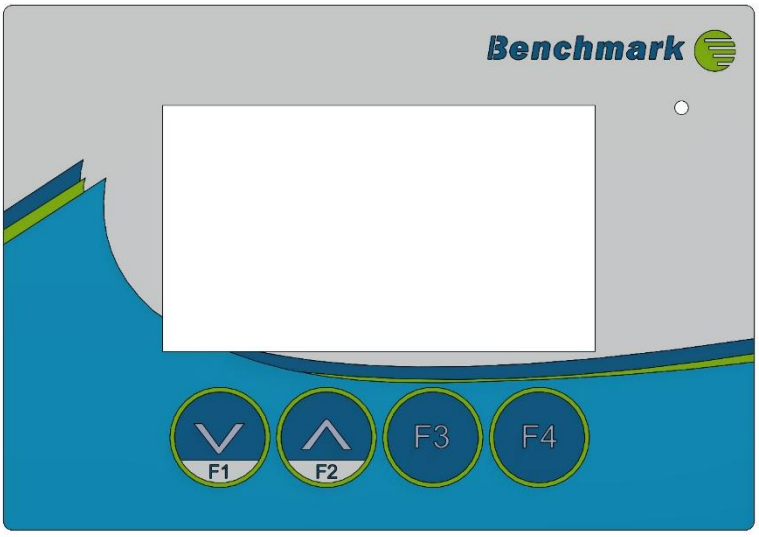


Figure 3 – Control Panel

The functions of F1, F2, F3 and F4 buttons depend on the meaning of the corresponding symbol appearing on the display. The following table shows the meaning of these symbols.

	This symbol denotes the menu. You can enter the menu by pushing the button corresponding to this symbol.
	This symbol denotes the settings page. You can enter the settings page by pushing the button corresponding to this symbol.
	This symbol denotes the value increase key. You can increase the value by pushing the button corresponding to this symbol while adjusting the numerical values such as temperature or password.
	This symbol denotes the value decrease key. You can decrease the value by pushing the button corresponding to this symbol while adjusting the numerical values such as temperature or password.
	This symbol denotes the left key. It appears on the graph screen. The next graph appears when the button corresponding to this symbol is pushed.
	1) This symbol denotes the right key when the right and left keys appears on the same screen. The previous graph is passed when the button corresponding to this symbol is pushed.

	2) It denotes the tab button when the left and the right keys do not appear on the same screen.
	This symbol denotes enter key. It is used for approval of adjustments.
	This symbol denotes backspace. You can return the previous page or exit from the page by pushing the button corresponding to this symbol.
	The symbol is on the green button which is used to start the program.
	The symbol is on the red button which is used to stop the program.
	The key corresponding to this symbol is used to turn the illumination on or off. If the key is green, it shows that the lamp is off. The lamp goes on when the key is pushed and the key turns red. Lamp goes off when the red key is pushed.
	This symbol denotes the explanation of the error codes. You can learn detailed explanation about the error by pushing the button corresponding to this symbol. It appears in case of failures.
	This symbol denotes the alarm mute key. You can mute the audible alarm by pushing the button corresponding to this symbol when the alarm is activated in case of error.

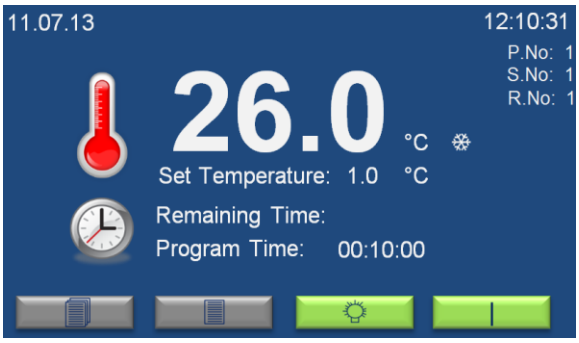
13.8. PRIOR TO OPERATION

- Plug-in the instrument to correctly grounded sockets
- Switch the incubator on by using power switch. See that power switch LED is on.
- See that the display and control panel activates.
- Learn the functions of the control panel (See Section 5.7).
- Set the program and start it (See Section 6.1).

1. OPERATING PRINCIPLES

6.1. PROGRAMMING

> At most 70% of the surface area of the shelves should be used in order to obtain a uniform temperature distribution.



When the H2206 Series incubator is powered on, the loading screen and then the main screen on the left appear. Chamber temperature and set temperature can be seen. If time is set for the program, program time and the remaining time are displayed below the temperature values. 'P.No', 'S.No' and 'R.No' on the right upper corner of main screen are program number, step number and repeat number, respectively.

Current time and date are shown at the top line. "❄" symbol flashes on this screen while the incubator is cooling. "♨" symbol flashes on this screen while incubator is heating.



The H2206 Series offer 20 program slots with 20 steps each. There are two set screens; one screen for program setting and another for step settings. The screen shown is for program setting. Increase (F1) and decrease (F2) keys are used to change the selection value. Tab key (F3) is used to change the menu selection.

To exit to the main screen, "screen display" option should be highlighted, then press the 'enter' key (F4).



To enter step settings, select "Program" in the program setting menu, then press the 'enter' key (F4).

'Step No.' indicates the current step. Increase (F1) and decrease (F2) keys are used to change the selection value. Enter key (F4) is used to change the selection.

Press the back key (F3) to return the operation settings screen.

Follow the steps below to set a program:

I- Push settings page key (F2) on the main screen.

2- Password query screen appears. The password is 0000 for the first use. Enter the password by using increase (F1) and decrease (F2) keys and push enter key (F4). A user password can be set in the settings menu (See Section 6.3.1).

3- *Program*- Use increase (F1) and decrease (F2) keys to set the program number to edit and push enter key (F4).

4- *Step No.*- Use increase (F1) and decrease (F2) keys to set the step number and push enter key (F4).

5- The selection is on *Temperature*. Use increase (F1) and decrease (F2) keys to set temperature and push enter key (F4).

6- *Time Function*- If time will be used for the step, choose *Time*. When you choose *Hold*, the program runs until it is manually stopped. Use increase (F1) and decrease (F2) keys to choose *Time* or *Hold* and push enter key (F4).

7- *Time*- after *Time Function* is set. When the *Time Function* is set as *Time*, the time can be set from 0 minute to 99 hours 59 minutes by using increase (F1) and decrease (F2) keys. If the time is set as 00:00, the corresponding step does not run and the program will run the next step.

8- *Alarm Range*- After *Time* is set and enter key (F4) is pushed. The *Alarm Range* can be set between 1.0^{o}C and 10.0^{o}C by using increase (F1) and decrease (F2) keys.

9- *Timer On at Set*- after *Alarm Range* is set and enter key (F4) is pushed. *Timer On at Set* can be chosen as *ON* or *OFF* by using increase (F1) and decrease (F2) keys. When it is chosen as ON; time starts to count when the temperature reaches the set temperature. When it is chosen as OFF; time starts to count when the corresponding step starts.

10- Push enter key (F4) to set the next step and apply the steps from 4 on. If all steps are set, push back key (F3).

11- Push tab key (F3) to continue to settings of the program.

12- *Starting Step No*.- Shows the step number to start from when the program starts. Choose the step number by using increase (F1) and decrease (F2) keys and push tab key (F3).

13- *Repeated Operation*- Set repetition number by using increase (F1) and decrease (F2) keys and push tab key (F3).

14- *Stop at Power Failure*- It can be chosen as *ON* or *OFF* by using increase (F1) and decrease (F2) keys.

If *Stop at Power Failure* is *ON*;

- The program will be interrupted in case of power failure. When the power failure is over, 'Power Failure' error appears on the screen.

If *Stop at Power Failure* is *OFF*;

- The program will continue to run in case of power failure.
    - If the temperature is in the temperature alarm range, there will be notification regarding power failure. Push question mark key (F3) to see the notification.
    - If the temperature is out of the temperature alarm range, 'Out of Temperature Range' error appears.

15- *Delay*- Can be set from 0 to 99 hours 59 minutes by using increase (F1) and decrease (F2) keys. The program starts after the delay time ends.



16- *Screen Display*- as numerical or graph by using increase (F1) and decrease (F2) key. Push enter key (F4).

17- Main screen appears. Push green start key (F4) to start to run the set program.



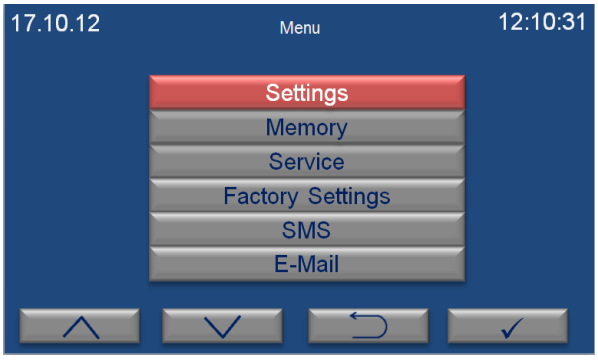
6.2. COMPLETION OF OPERATION

- See that the program is over.
- Push red stop key (F4) to stop the running program at any time.
- Take the samples out. Be careful while handling the samples after the operation as they can be hot.
- Wipe the chamber surface if needed when the chamber is cold.
- You may leave the incubator at the stand-by position or switch it off.

☞	If the unit is in START position when the door is open for long periods, it will keep operating and the heaters can over-heat. This situation may result in irreparable damage to the heaters and other components.

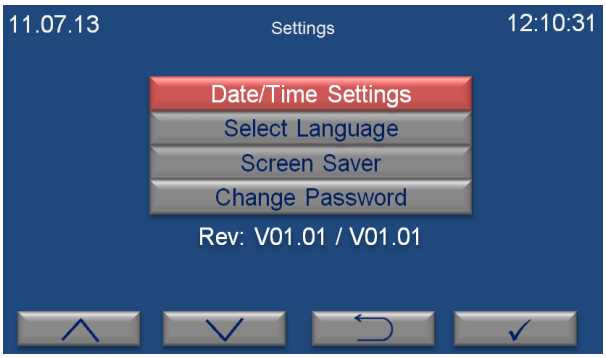
6.3. MENUS

When menu key (F1) is pushed on the main screen, the password query screen appears. Enter password and push enter key (F4).

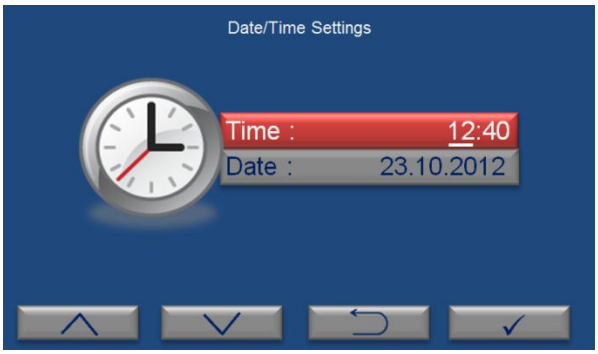


The Menu page appears when the password is approved by pushing enter key (F4). Submenus can be selected by using the increase and decrease keys. Press the enter key (F4) is to enter the selected menu.

6.3.1. SETTINGS



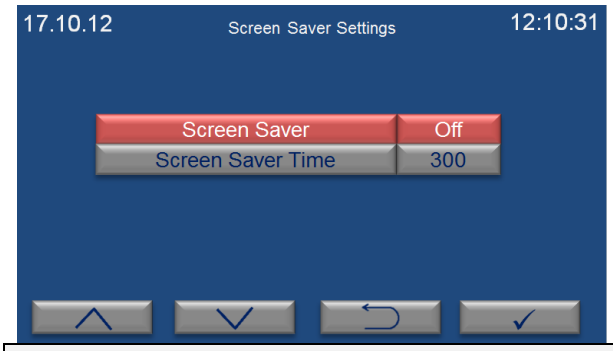
Settings- Select the required submenu by using the value increase and decrease keys.



Date/Time Settings- Time is shown in the format of "hour:minute" Values are adjusted by pushing the value increase (F1) and decrease (F2) keys. Push enter key (F4) to continue. To exit this page without any change, push backspace key (F3).

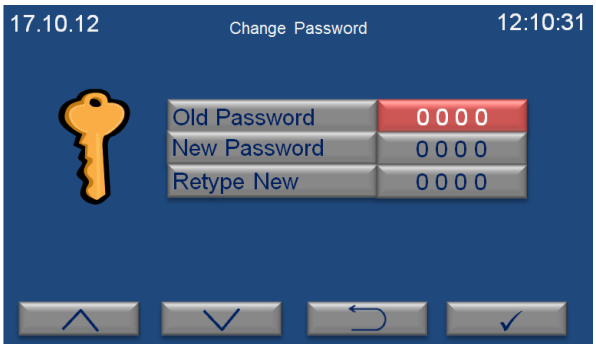


Select Language- The language of the control panel can be set as Turkish, English, French, Russian or Spanish. Select the language and then push the enter key (F4) to save the selection. If you want to exit this page without any change, push the backspace key (F3).



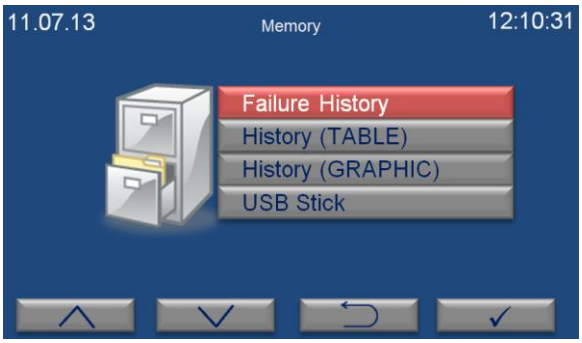
Screen Saver Settings- The *Screen Saver* can be on or off by pushing the value increase (F1) and decrease (F2). If the option of "ON" is selected, activation time of screen saver is adjusted on *Screen Saver Time* in minutes. If you want to exit this page without any change, push the backspace key (F3).

☞ It is suggested to use *Screen Saver* as ON for energy saving.

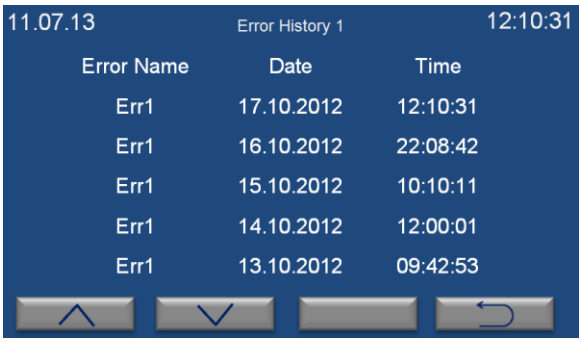


Change Password- After the old password value is entered the new password value can be entered in the *New Password and Retype New* sections. If you want to exit this page without any change, push the backspace key (F3).

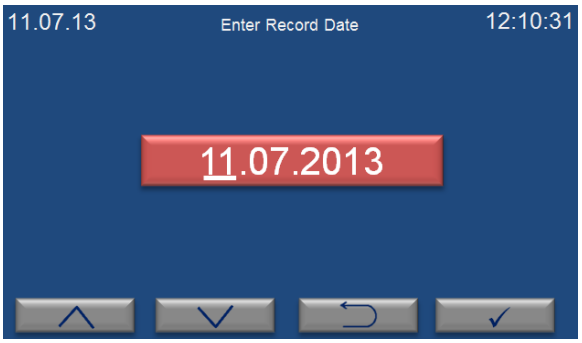
6.3.2. MEMORY



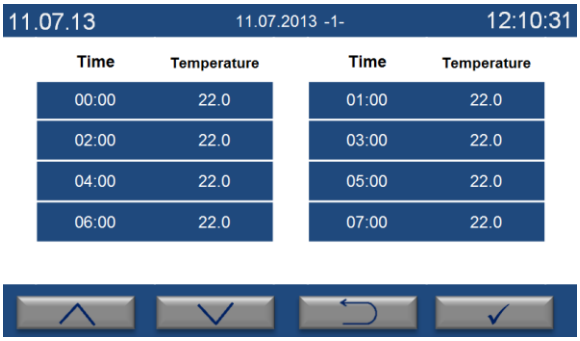
Memory Menu



Failure History- The last 50 errors can be followed on this page. There are 10 pages in total for error history with 5 failures are listed on each page. Failures are listed from the newest to oldest. Push the value increase (F1) and decrease (F2) keys to cycle the pages. Push the backspace key (F4) in order to exit the page.



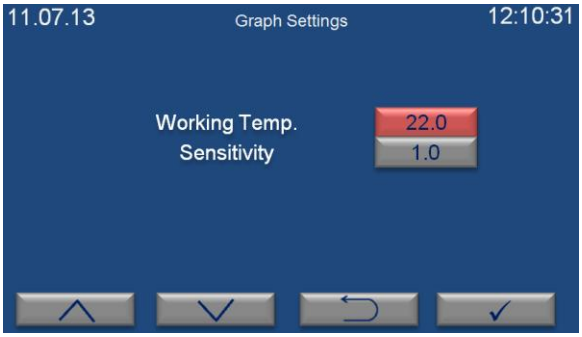
History (TABLE)- Enter a date to analyze corresponding operation by pushing the value increase and decrease keys. Push the enter key (F4) to access the table.



Temperature values corresponding to the selected date are shown on three pages. Push the value increase (F1) and decrease (F2) keys to pass from one page to another. A "–" appears in the temperature column if the unit does not run on the selected date. Push the backspace key (F3) to return previous page.

> When the temperature sensor is broken, "–" appears in the temperature column since temperature cannot be read.

History (GRAPH)- Enter a date to analyze corresponding operation and then push the enter key (F4). You can analyze the data in the graph. The data belonging to the other dates can be followed by using left (F2) and right (F3) keys. Push the backspace key (F4) to return the previous page.



The page on the left appears when the settings key (F1) is pushed on the GRAPH page. Temperature axis (y-axis) can be adjusted on this page. Working temperature determines the midpoint of the temperature axis. The working temperature value should be close to the set temperature value for more comfortable observation. Sensitivity value is the difference between two values on the y-axis. As sensitivity value set smaller, a more detailed graph appears.

.

> Values are recorded every one hour and while program is running.

7. PERIODIC MAINTENANCE AND CLEANING

7.1. PERIODIC MAINTENANCE

The instrument does not require any periodic maintenance.

7.2. CLEANING

- Prior to cleaning, please unplug the device and clean at the room temperature.
- After every operation wipe down the chamber surface
- A piece of wet cloth may be used in order to remove the dust and residue from the device.
- Mild detergent use is recommended to remove difficult residues.
- Clean the condenser filter regularly.
- Please be aware of the undesirable effects of strong chemicals and be careful while applying them.
- Protect the device against rust by cleaning the rust as soon as possible when detected.

8. DISPOSAL MANAGEMENT

The currently valid local regulations governing disposal must be observed. It is the responsibility of the user to arrange proper disposal.

All parts which may comprise potentially infectious materials have to be disinfected by suitable validated procedures (autoclaving, chemical treatment) prior to disposal. Applicable local regulations for disposal must be carefully observed.

The instruments and electronic accessories (without batteries, power packs etc.) must be disposed of according to the regulations

.

Batteries, power packs and similar power sources should be dismounted from electric/electronic parts and disposed of in accordance with applicable local regulations.

9. TROUBLESHOOTING

If the device fails to operate, please check the following:

- The power switch is on;
- The fuse is sound;
- The plug is plugged-in properly;
- The plug is not defective;
- The mains supply is present.

If the incubator does not heat, check the following;

- The program has started.
- The safety thermostat is set at a temperature higher than the set temperature.

If the temperature exceeds the set value, check the following;

- The internal circulation fan operates.

If the incubator does not cool appropriately, check the following;

- The internal circulation fan operates,
- The ambient temperature does not exceed 20 (± 5)°C limits.

9.1. ERROR CODES

The blue colored screen turns red in case of any failure and a short explanation of the error appears at the bottom line. Push the key corresponding to question mark (F3) for a detailed explanation.
Failures which may be encountered during operation are listed below:

EoFF: This error code shows power failure. If *Stop at Power Failure* is *ON*, the program is interrupted in case of power failure. When the power failure is over, 'Power Failure' error appears on the screen.

> ☞ After power interruption, push the key corresponding to question mark (F3) to see the time when power interruption occured.

Err1: Appears when temperature sensor is defective.

Err2: Appears when there is a communication error between display and main PCB.

Err3: Appears when there is a failure in cooling system.

Err5: Appears when door is kept open for a while.

Err6: The temperature in the chamber is not in the temperature alarm range.

Err7: Appears when software version is not compatible. Push the F3 key corresponding to the question mark to see the explanation. Inform the authorized BENCHMARK SCIENTIFIC agent regarding the error explanation.

> ☞ A list consisting of the codes of errors can be accessed from the memory page (See section 6.3.2). 'EoFF', 'Err3', 'Err5' and 'Err6' do not appear on main screen and they are only shown in the error history.

> ☞ In case of any error, the program is stopped automatically.

> ⚠ If an error occurs, please contact to an authorized Benchmark Scientific agent to seek technical help.

9.2. FUSE REPLACEMENT

The fuses shall always be replaced by authorized personnel.

10. ELECTRICAL CIRCUIT DIAGRAM

10.1. H2206-120 / H2206-250 ELECTRICAL CIRCUIT DIAGRAM

