



Operating Instructions



13L and 24L Water Bath

WB301

WB401

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Please read the operating instructions in full before starting up and follow the safety instructions.
The appearance and specifications are subject to change without notice.

PREFACE

Welcome to your Water Bath operating instructions. Users should read this manual carefully, follow the instructions and procedures, and be aware of all cautions when using this instrument.

DECLARATION OF CONFORMITY

This water bath complies with the relevant standards of
2014/35/EU EN61010-1:2010+A1:2019+AC:2019
2014/30/EU EN55011:2016+A2:2021, EN61326-1:2013,
EN EIC 61000-3-2:2019, EN61000-3-3:2013/A1:2019

1. SAFETY INSTRUCTIONS

Read the operating instructions in full before starting up and follow the safety instructions.

- Ground the socket before use.
- Water must be filled into the chamber before power-on.
- Avoid operating the bath without water.
- The symbols below are marked on the equipment and in this manual to indicate:



Caution: Surfaces can be hot during and after use



Caution: Socket must be earthed
(protective ground contact).

2. UNPACKING

Carefully unpack the device and inspect it for any damage.

Report any shipping damage to the carrier immediately.



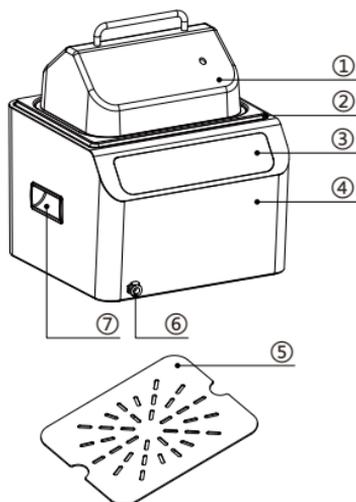
Caution:
Do not plug in the device if the device and/or plug are visibly damaged.

Box contents

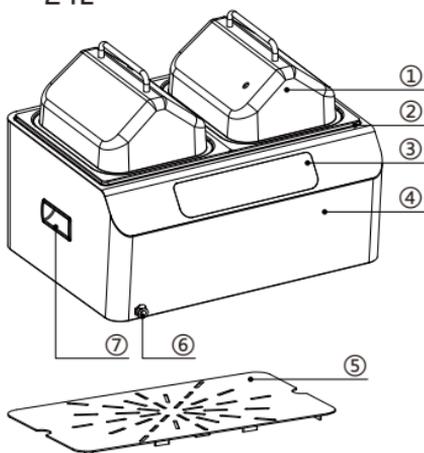
Model	WB301	WB401
Water bath	1	1
Transparent lid	1	2
Base tray	1	1
Power cable	1	1
USB Type-A cable	1	1
Operating manual	1	1

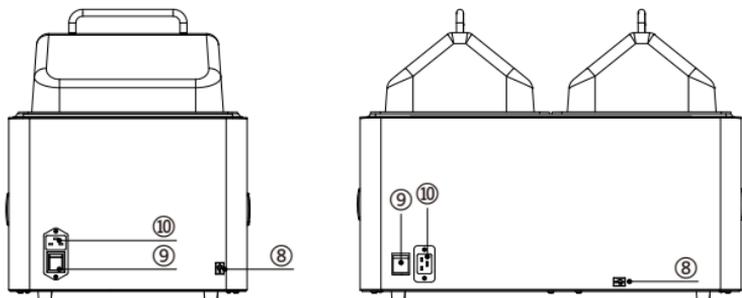
Note: The USB port at the back allows for software updates. For more information on updating the software, please contact your local distributor or the manufacturer.

13L



24L





- | | |
|---------------------------|----------------|
| ① Transparent lid | ⑥ Drain port |
| ② Stainless-steel chamber | ⑦ Handle |
| ③ LED display | ⑧ USB port |
| ④ Water bath | ⑨ Power switch |
| ⑤ Base tray | ⑩ Power socket |

3. INSTALLATION

3.1 Assembly of the equipment and components

The water bath has three main components, the bath, the lid and the base tray. The base tray fits into the bath with the feet downward so that it creates a gap between the bottom of the chamber and the tray.

Note:

1. For optimal temperature stability, avoid allowing the base tray and sample container to touch the sides of the chamber while operating.
2. The lid should only be lifted by the handle, as other parts

can become hot during use.

3. The ventilation hole allows for temperature probe insertion.
Do not seal this vent, as doing so may cause pressure to build up within the bath.

3.2 Instrument placement

Place the water bath on a level, non-combustible surface. Ensure that the mains plug and the switch are easily accessible.

3.3 Electrical supply

- Check that the supply voltage marked on the serial number label, and the type of mains plug, are correct for your mains supply outlet, which must have a grounded connection.
- To disconnect the equipment from the mains supply, remove the mains plug from the mains supply outlet.

4. CORRECT USE

4.1. Avoid operating the bath without water

- Dry-start runs may negatively affect the service life of the equipment, therefore avoid running the bath without water.
- The recommended minimum water level is one-third of the chamber height.
- The bath features dry-start protection, which automatically shuts off heating if the water level is too low.

In this instance the bath will display “*dr-5*” and sound an

alarm. If the protection program fails to detect the dry-heating, built-in safety temperature cut-out switch will cut off the heating to protect the water bath when heated to a certain temperature .

Note:

The dry-start protection program is on by default.

The chamber internal surface can become very hot if an accidental dry start has occurred, even if the dry start cut out has operated. Avoid touching the chamber until it has been left to cool.

4.2. Filling the baths

For safe use, please do not fill the bath with water during heating process. Please turn off the power first if you need to add water.

If filling water triggers a safety warning during the heating process, please restart the machine to dismiss the warning.

- Only water can be used as the media in the bath.
- To prevent corrosion, do not use unfiltered water containing metal particles.
- Do not use ultrapure water, water with high calcium or magnesium ions, or deionized water.

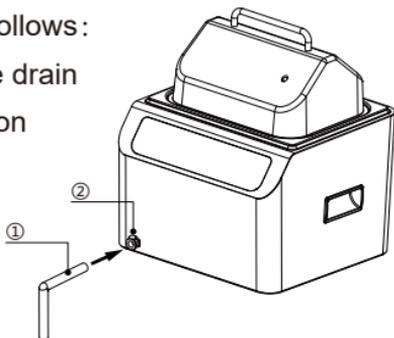
4.3. Emptying the baths

Before emptying any bath, disconnect the device from the power supply and pull out the plug. Then allow the water temperature to fall to a safe level and take reasonable precautions to prevent accidental spillage.

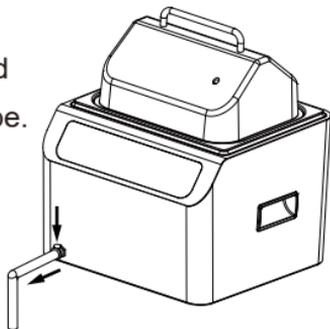
The drainage operation is as follows:

1. Insert the drain pipe into the drain port according to the direction shown in the figure.

- ① Drain pipe
- ② Drain port



2. After draining, loosen the lock of the drain port in the direction of the arrow as shown in the figure, and then quickly pull out the drain pipe.



4.4. Using transparent lid

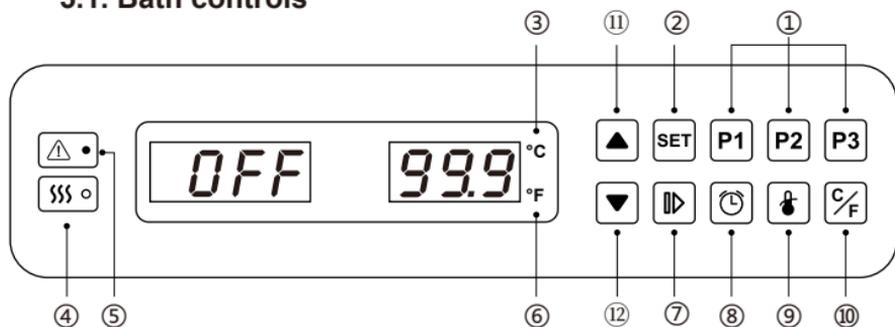
- When the setting temperature is above 60°C , use the lid to maintain proper temperature control and ensure that the water temperature reaches the set point.
- The lid will also prevent excessive evaporation that requires the bath to be filled more often and will save energy.

4.5. Using base tray

- Using the base tray can improve temperature control inside containers.
- Don't put the containers or other items into the stainless -steel chamber directly. Avoid the containers or other items direct contact with the inside walls of chamber.

5. OPERATION

5.1. Bath controls



- | | |
|---------------------|-------------------------------|
| ① Preset Programs | ⑦ Run/Stop |
| ② Set | ⑧ Timer |
| ③ °C indicator | ⑨ Over-Temperature Alarm Key |
| ④ Heating Indicator | ⑩ °C/°F switch |
| ⑤ Alarm Indicator | ⑪ Up button (adjust values) |
| ⑥ °F indicator | ⑫ Down button (adjust values) |

5.2. Display

The LED displays indicate the system's status:

Heating Off:

- Left display: Displays " *OFF* "
- Right display: Displays the current bath temperature

Heating On:

- Left display: Displays remaining time in Countdown Timer Mode, or " *CONT* " when in Continuous Mode.
- Right display: Alternates between the current bath temperature and the set temperature.

The following section, 5.3 "Run/Stop", will illustrate the above in an example.

5.3 Setting the Heating Temperature

Tap  or   to enter temperature setting.

Example Parameters:

Current Temperature: 37.0°C

Current Set Temperature: 42.5°C

Desired Set Temperature: 50.0°C

Operation	Display	Remarks
	<i>OFF & 37.0</i>	
  or 	<i>42.5 → 50.0</i>	<ul style="list-style-type: none">• Tap   or tap  and the current Set Temp will flash, ready to be adjusted.• Adjust the values with  . Hold   to scroll through digits more quickly.
	<i>50.0</i>	<ul style="list-style-type: none">• Tap  to save and confirm the new value.• The newly set value (50.0) will show for 2 seconds as a confirmation.
	<i>OFF & 37.0</i>	

5.4 Run/Stop

Key Operation: Press  to Run/Stop heating.

Example Scenario:

Note: The parameters used in the examples throughout this manual are for demonstration purposes only.

Parameters:

- Current Temperature: 37.0°C
- Set Temperature: 50.0°C

Operation	Display	Remarks
	<i>OFF & 37.0</i>	
	<i>37.0 → 50.0</i> <i>37.1 → 50.0</i> <i>37.2 → 50.0</i>	The Current Temp and Set Temp alternate on the display when heating is active
	<i>OFF & 37.0</i>	

5.5 Using the Countdown Timer or Continuous Operation

Tap  to enter into setting a Timer or Continuous Mode.

Tap  again to cycle between Timer and Continuous Mode.

Countdown Timer

- The countdown timer range is 1min – 99Hr59min.
- The countdown timer only begins to count down after reaching the Set Temperature.
- After the countdown reaches 0, heating stops and the alarm sounds three times.

When the bath is heating and the countdown timer is adjusted, the new setting takes effect immediately. If the current bath temperature is within $\pm 0.3^{\circ}\text{C}$ of the set temperature, the countdown timer begins. Otherwise, the timer starts once the bath temperature reaches the target range.

Continuous Operation

- Continuous operation maintains heating indefinitely at the target temperature.
- The left display shows ' *CONT* ' to indicate this mode.

Adjusting the Timer

Initial Setting: Timer @ 01:30 (1 Hour 30 Minutes)

Operation	Display	Remarks
	<i>OFF & 37.0</i>	
	<i>01:30</i>	Tap  to enter into Timer Setting. The Hour digits flash, ready to be adjusted.
  	<i>01:30 → 02:30</i>	Adjust the Hour digits and tap  to confirm
  	<i>02:30 → 02:45</i>	Adjust the Minutes digits and tap  to confirm

Switching between Timer to Continuous Mode

Operation	Display	Remarks
	<i>OFF & 37.0</i>	
	<i>02:45</i>	Tap  to enter into Timer Setting.
 	<i>02:45 → CONT</i>	Tap  to cycle to <i>CONT</i> , and tap  to confirm.

Note: Switching from Continuous Mode to Timer Mode involves the same process as specified above.

5.6 Configuring the Presets

The bath has 3 presets: P1 P2 P3. These presets include a temperature parameter and a duration parameter (either a timer value or continuous).

Setting the Preset Parameter Values

Operation	Display	Remarks
Hold P1	<i>CONF & 37.5</i>	<ul style="list-style-type: none"> Temperature flashes and can be adjusted and set. For this example, we'll change the Set Temp from 37.5 to 42.5°C.
▲ ▼ SET	<i>37.5 → 42.5</i>	
	<i>CONF & 42.5</i>	From here, if you tap SET , then these settings would be saved.
⏸	<i>00:15</i>	<ul style="list-style-type: none"> Tap ⏸ to cycle between <i>CONF</i> and timer mode. Here the timer was initially set for 15 minutes
▲ ▼ SET	<i>00:15 → 01:15</i>	• First, you will be prompted to set the Hour duration
▲ ▼ SET	<i>01:15 → 01:30</i>	• Second, you will be prompted to set the Minutes duration
	<i>01:30 & 42.5</i>	

5.7 Using the Presets

To use a preset, for ex. P1, simply press **P1** and then press **▶▶** to run the preset.

Operation	Display	Remarks
P1	<i>CONF & 37.5</i>	You can see the preset parameters.
▶▶		The bath runs with the parameters of the preset.

5.8 Switch between Fahrenheit (°F) and Celsius (°C) Units

The temperature unit indicator will illuminate °C for Celsius and °F for Fahrenheit.

Switching the units

Operation	Display	Remarks
	°F or °C	

5.9 Setting the Over-temperature Alarm

You may set a cutoff value that will be the maximum temperature the bath is allowed to reach before power cutoff occurs.

Setting the Over-temperature Alarm

Operation	Display	Remarks
	95.0	You can adjust the value
  SET	101	The maximum over-temperature alarm setting is 101°C.

If the water bath temperature sensors receive a reading that exceeds the over-temperature setting, the water bath stops heating and displays  and sounds an alarm.

For example, let's say the over-temperature setting is 90.0°C, and the water bath temperature reaches 91.0°C.

The alarm can be turned off by following one of the methods below:

- Turn off the power and the alarm shuts off. Restart the machine once the water bath temperature is lower than the over-temperature setting.
- Add some cold water so that the water temperature rapidly drops below the over-temperature setting, and the alarm will shut off.
- Set the over-temperature setting (e.g. 90.0 → 95.0) above the current water bath temperature, and the alarm will shut off.

5.10 Dry-Start Protection Alarm

When the device starts heating, the dry-start protection alarm function immediately functions. If the system detects the water bath is dry, heating will stop and an alarm will sound out.

Note: The dry-start protection mechanism works by heating up the bath a few degrees and checking the water level. If the set temperature is too close to the current water bath temperature and/or the water level is quite low, then the overshoot past the set temperature point will

be quite high. To avoid such conditions, ensure the water level is at an adequate height of at least 50mm.

6. CALIBRATION

6.1. Calibration condition

To ensure accurate calibration results, ensure the following:

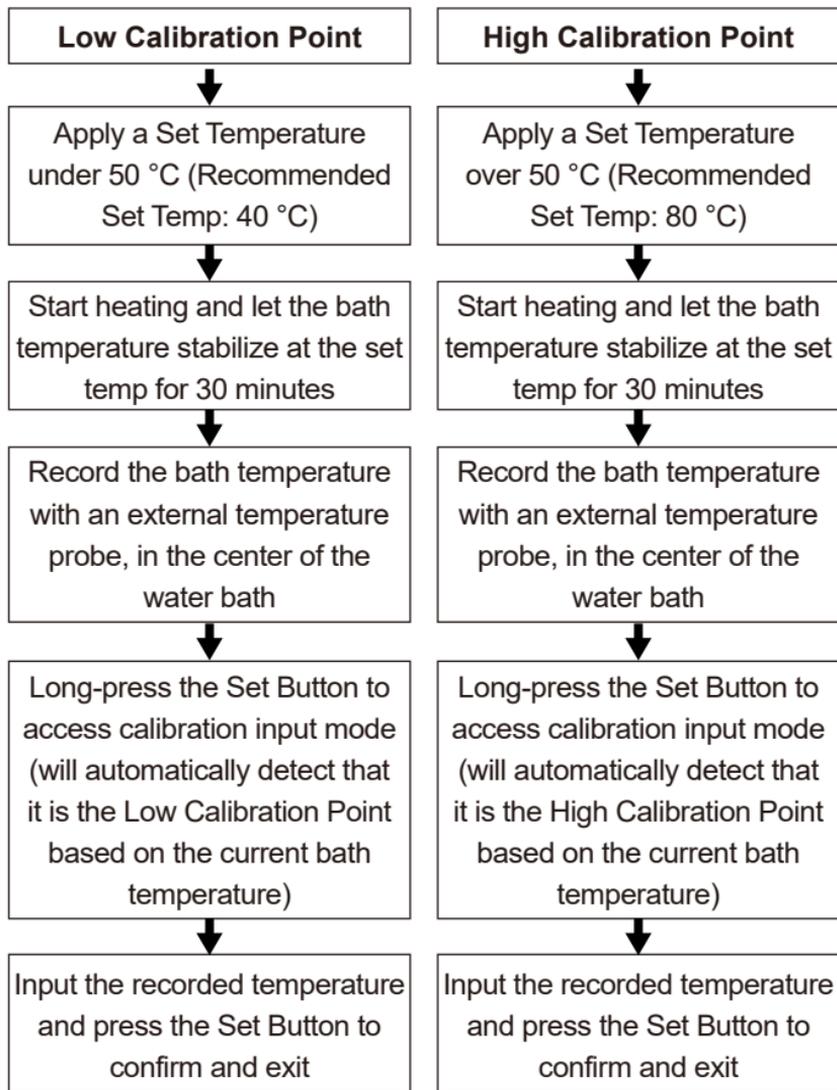
1. The accuracy of the temperature probe used for calibration shall be more than 10 times that of the water bath display (which has a precision of 0.1°C).
2. The ambient temperature shall be stable to $\pm 1^{\circ}\text{C}$ without air convection.
3. Allow the bath temperature to stabilize at the calibration temperature for 30 minutes before inputting the calibration reading.
4. Fill the water bath to a height of 50mm, and place the temperature probe in the center of the water bath, 40mm from the sides.

6.2. Dual Point Calibration

Our instrument employs two-point calibration, with the Low Calibration Point between 5-50°C (40°C recommended), and the High Calibration Point between 50-99.9°C (80°C recommended)

Calibration Procedure

1. Fill your water bath to a height of at least 50mm
2. Power on your water bath (starting from ambient temperature conditions)
3. Follow the Low Calibration Point procedure in the flowchart
4. Follow the High Calibration Point procedure in the flowchart



7. FAULTS

Error code	Cause	Solution
<i>Err1Shrt</i>	Temperature sensor 1 short-circuit	Check the temperature sensor 1 or motherboard for a short circuit fault.
<i>Err2OPn</i>	Temperature sensor 1 open-circuit	Check if the sensor 1 is well connected.
<i>Err3Shrt</i>	Temperature sensor 2 short-circuit	Check the temperature sensor 2 or motherboard for a short circuit fault.
<i>Err4OPn</i>	Temperature sensor 2 open-circuit	Check if the sensor 2 is well connected.
<i>Err5dry</i>	Dry-start alarm, no water in the chamber or the water level is below the min.	Switch the bath off and refill the bath with water
<i>Err6Otp</i>	Over-temperature Alarm 1. The initial water temperature is above the <i>Otp</i> value 2. The <i>Otp</i> setting value is too low	1. Let water cool. 2. Reset the <i>Otp</i> value
<i>Err7rOn</i>	Temperature sensors malfunction	Contact supplier or manufacturer.

Error code	Cause	Solution
<i>Err8 Out</i>	Calibration temperature not within the required range	1. Check if the low calibration point or high calibration point is within the required range. 2. Check if the temperature difference between the one measured by a thermometer and the one measured on the water bath is more than 10°C (If it is, there is issue on the temperature probe on the water bath)

8. MAINTENANCE AND CLEANING

Correct use of the instrument to keep it in good working condition will help extend its service life.

Disconnect the power supply before maintenance and cleaning.

No routine maintenance is required except for cleaning. Clean the outside of the equipment with a damp cloth soaked in soap, dish washing liquid or alcohol. Wait for dry before continuing to use. There are no user serviceable parts inside the unit.

9. TECHNICAL DATA

Model	WB401	WB301
Reservoir Capacity	24 L	13 L
Heating temperature range	RT+5°C to 99.9°C	RT+5°C to 99.9°C
Permissible ambient temperature	10-35°C	10-35°C
Over temperature cut-off	Yes	Yes
Dry-start protection	Yes	Yes
Temperature stability	±0.3 °C	±0.3 °C
Display resolution	0.1 °C	0.1 °C
Temperature uniformity	±0.3 °C	±0.5°C
Display	LED	LED
Time setting range	0~99H59min	0~99H59min
Chamber dimensions (W x D x H)	500 x 300 x 200mm / 19.7 x 11.8 x 7.9in	300 x 240 x 200mm / 11.8 x 9.4 x 7.9in
Dimensions (W x D x H) (incl. cover)	550 x 415 x 427mm / 21.7 x 16.3 x 16.8in	340 x 348x 427mm / 13.4 x 13.7 x 16.8in
Weight	14.5kg / 32.0lbs	7.3kg / 16.1lbs
Power Supply	100-120V 60Hz / 200-240V 50Hz	
Power	1200W	1000W

10. WARRANTY

We guarantee that our scientific instruments adhere to the most rigorous engineering and quality standards. This instrument is warranted to be free from defects in materials and workmanship under normal use and service, for a period of 24 months from the date of dispatch. The warranty is extended only to the original purchaser. For claims under the warranty, please contact your local supplier. After the warranty period expires, the manufacturer retains the right to invoice the cost price for the repair or maintenance of a faulty device, along with any associated service fees.

Scope of Warranty

The following conditions are not covered under the warranty.

- Faults or damage caused by negligence, improper installation, improper operation, or failure to use and maintain the machine in accordance with the instructions in this operating manual.
- Issues caused by unauthorized disassembly or modification.



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